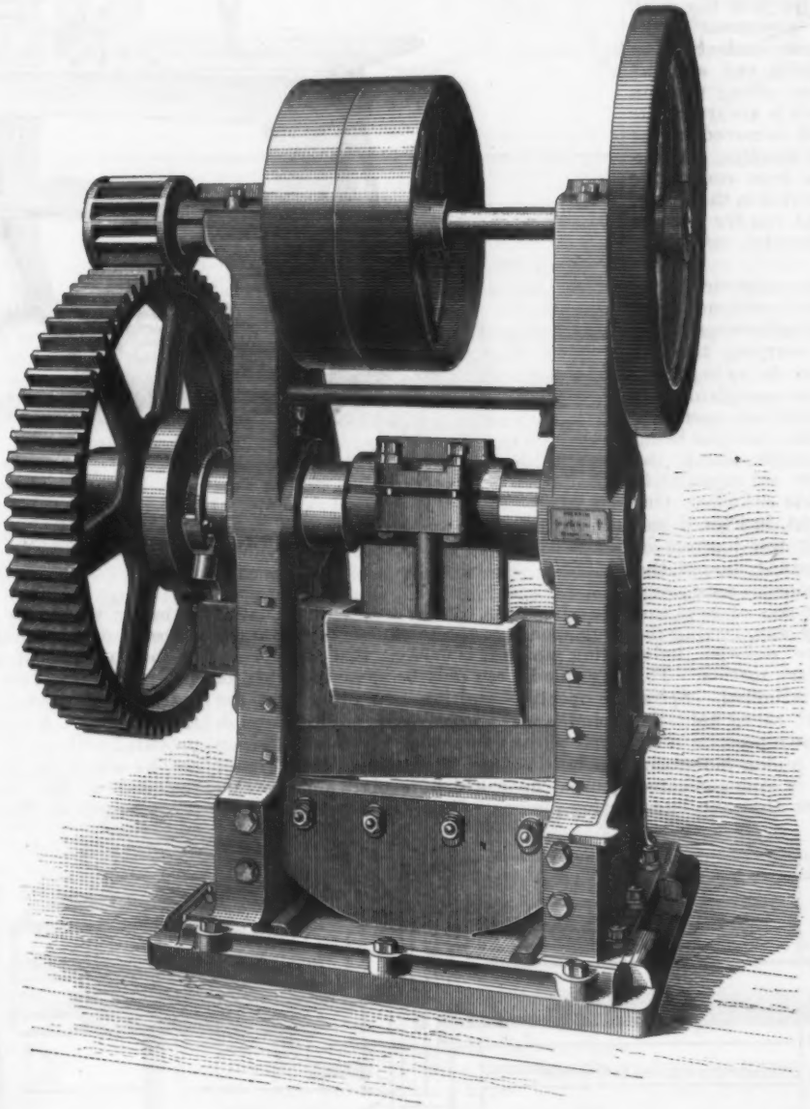
THE IRON AGE

THURSDAY, MAY 29, 1890.

Guillotine Shear.

The annexed cut represents a shear of the guillotine type built by the Lloyd Booth Company, Youngstown, Ohio, for cutting skelp and light plates. The gearing is of the proportion 5½ to 1, giving ample power to shear plates up to ¾-inch thickness and 24 inches wide. This shear is also provided with an automatic stop motion of an improved design, which allows the head to stop at the full opening of each stroke. The tool is finished in the most substantial manner throughout, the eccentric shaft being of forged steel and working in solid brass journals. It is intended when a shear of this design is used to keep the knives slightly above the floor of the mill, the plates being carried to and delivered from it by light tables or rollers, placed both in front and back of it, in order that the plates can be fed through and stopped at the proper point to cut them to the length desired.



GUILLOTINE SHEAR.

In some experiments lately made in England to test the merit of electric welding, a 1½-inch iron bar was welded both by means of electricity and by hand. The former stood a strain of 91.9 per cent. of the strength of the metal itself, and the latter 80.3 per cent. The electric weld, however, showed cracks when bent cold at an angle of 66°, whereas the hand made joint stood 138° of bend.

The New Navy Bill.

The magnificent scheme for naval construction presented early in the present session of Congress by Mr. Hale's Senate Committee at last resolves itself into very moderate proportions. The original proposition was to expend something like $55,000,000 for eight battle ships, besides gunboats, monitors, &c.

A correspondent says: The Navy Appropriation bill, as it passed the House, provided for only four large vessels instead of ten, and for no gunboats or torpedo boats whatever. The cost of three of the vessels, which are battle ships, is limited to $4,000,000 each by this bill, while the cost of the fourth, a fast armored cruiser, making 20 knots an hour, is limited to $2,750,000. This represents a total of $14,750,000, of which the customary fractional part alone is to be appropriated during the first year. Thus the bill as it reached the Senate called for four vessels instead of the 18 proposed by Mr. Hale's committee, at only about one-fourth of the outlay proposed by the latter, or something like $40,000,000 less, making allowance for differences in the provisions regarding armament. Nevertheless, the efforts of the Senate Committee on Appropriations in amending the construction items of the House bill, have not gone beyond adding two small and very inexpensive craft. One of these is a torpedo boat like the Cushing, which is to cost not more than $125,000; the other, a torpedo cruiser of 750 tons displacement, or less than that of the Petrel or Vesuvius, which is to make 23 knots, and to cost, exclusive of armament, not more than $350,000.

The change in the programme is supposed to be due to differences of opinion respecting the advisability of building any more heavy battle ships, rather than steel cruisers. Not only this, but a more serious obstacle presented itself in the demands for pension money. To provide for the national defense was a consideration of less importance than caring for the "scarred heroes" of the late unpleasantness.

Centering Machine.

This machine is provided with two sensitive balanced spindles for drilling and reaming at one setting of the work. Positive stops are so arranged as to secure perfect uniformity in the depth of the work and to surely prevent countersinking too deep, even by an inexperienced operator. The head is furnished with a positive locking device which prevents the spindles from being advanced except at the central point, and when advanced, no lateral movement can occur. The new form of vise used can be easily kept true and in perfect alignment with the spindles. The two spindles carry, one a drill and the other a reamer or countersink. They are driven at different speeds by a single belt over a pulley whose center is in line with the center of the lateral movement of the head. Both spindles are balanced by springs as in sensitive drills, and are successively advanced to the cutting position by a feeding lever, which is always in the same position and which is moved in the same direction for both spindles. A support is provided for the front end of the bar, while it is being inserted in the chuck, in addition to a V-shaped rest for the rear end. The chuck is thereby made self centering.

We will describe the construction of the machine more in detail, reference being made to the accompanying drawings. The swinging head, Fig. 4, carrying the two spindles, is so pivoted as to swing laterally in either direction far enough to bring each spindle successively to an operating position on the same line, this line being a prolongation of the center line of the work. The spindles are so mounted in their bearings as to slide endwise. One bearing, that at the right, in Figs. 2 and 3, is enlarged to admit the journals of pinions which are mounted around the spindles and serve to transmit rotary motion to the spindles by means of keys and keyways in the ordinary way, leaving the spindles free to move endwise independently of their rotary motion. The advance of the spindles is limited. Spiral springs are so arranged as to hold the spindles in their withdrawn position. By means of a rack and pinion movement longitudinal movement is communicated to the spindles. In order that the laterally moving head may be held in the required position during the successive operation of its various spindles, and in order to prevent all lateral movement of the head except at times when the operating spindle is wholly withdrawn from its work, the feeding pinion is made in a mutilated or segmental form, as shown in Fig. 3, and is so placed with reference to the rack teeth of the sliders F that its front radial surface may stand in an approximately vertical position when the spindles are withdrawn. The under side of the latterally-moving head is provided with projecting lugs, of such length as to permit the lateral movement of the head in front of the segmental pinion when its forward radial surface is in a vertical position, but to preclude such lateral movement at times when the pinion and connecting-spindle are advanced. As the width of the slots corresponds to the thickness of the operating pinion it is evident that the operating spindle can only be advanced when in an operative position. In order that the spindles may receive rotary motion through their pinions one of the pivots upon which the head swings is extended and forms a journal upon which revolves a pulley carrying pinions. Power is thus transmitted to the spindles in any position which they may occupy. Stops are provided in order to indicate that the head has received sufficient lateral movement.

The vise for gripping the work is mounted upon the bed and is capable of longitudinal movement and may be clamped at any desired point.

In the performance of work of this class it is of frequent importance that the reaming be not carried to too great a depth, as this unnecessarily enlarges the diameter of the recess in the end of the finished piece and injures the neatness of its appearence. It is also of frequent importance that many pieces be reamed to the same depth, and in all cases the cutting tools require to be supplied with oil or other lubrication in order to the best performance of their work. These results are achieved in this machine as follows:

CENTERING MACHINE.

It being previously understood that the advance of the drilling spindles is limited by the abutment of collars against shoulders, it is clear that the advance of the cutting tools carried by the spindles is also thus limited. A cross bar or stop plate, provided with an oil receptacle and channel, by which the oil is carried directly to the end of the work being drilled, is pivoted upon the frame of the vise, and is so located that it may be swung into or away from the path of the work in its advance through the gripping-jaws toward the spindle and latched in place. An adjustable stop is provided, by means of which the approach of the vise carrying the stop-plate toward the drilling-head may also be limited. It is clear that the stop may be so set as to permit such approach of the vise that the work abutting against its stop-plate will come suffi

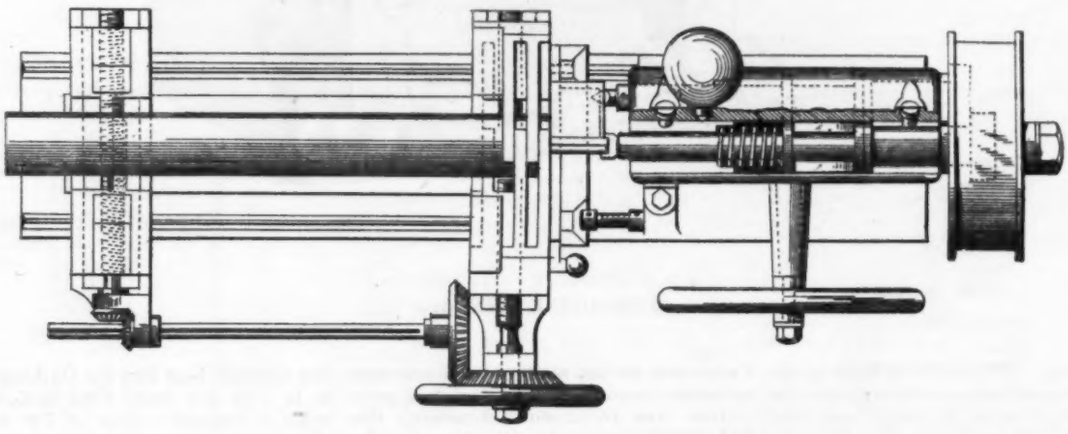


Fig. 2.—Plan View of Centering Machine.

ciently far into the path of the cutting-tool to be reamed to the desired depth without danger of being drilled or reamed beyond such desired depth; also, in special cases, if the stop plate be swung out of the path of the work, the work itself may be advanced through the vise far enough to receive any desired depth of reaming without interference with the adjustment of the stop, which may remain properly set for the majority of the work required.

In operation, the work having been gripped in the vise, as described, and the spindles being in rotation, the swinging head is brought into the proper position by means of the handle, when the first cutting tool is caused to advance by the movement of the pinion as described. This cutting tool having advanced to its limit, it is permitted to withdraw by the action of the spring upon its spindle, when the head is moved laterally, as required, and the second spindle is caused to act in a similar manner, and so successively through the series, if more than two spindles are employed. The work may then be removed and other work inserted, when the operations are repeated.

This machine is manufactured by the D. E. Whiton Machine Company, of New London, Conn.

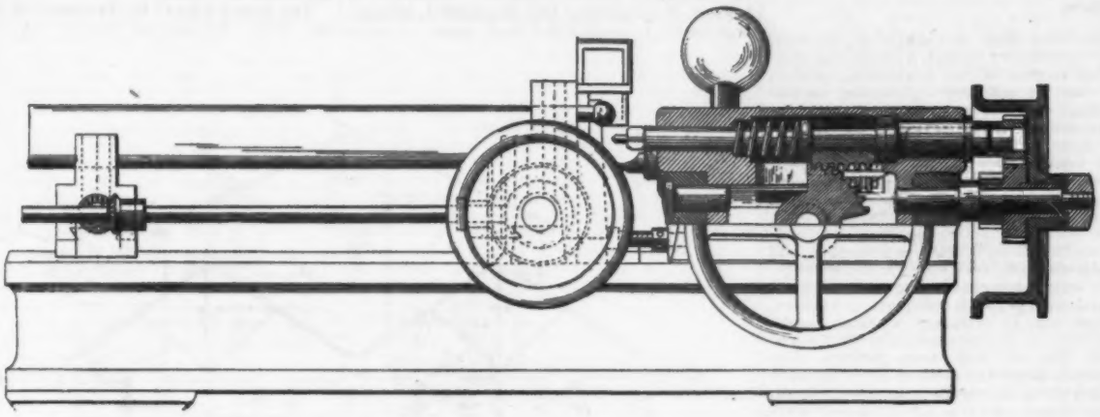


Fig. 3.—Side Elevation and Section of Centering Machine.

The *Journal* of Tower, Minn., says that the deepest test hole ever yet drilled in the iron country is the one bored near the company's barn at the Stone location by a "B" Sullivan drill. A hole $1\frac{3}{16}$ inches in diameter was drilled at an angle of 24 degrees to a depth of 1340 feet. The work was done under the supervision of Wm. H. Cole, a veteran drill runner and diamond setter. The Minnesota Iron Company have at present ten diamond drills in operation, turning the leaves of creation's treasure book and bringing to light the deposits of one of the most important resources of the State. The entire work is now under the supervision of Herbert A. Wilcox, a mining engineer and graduate of the mining school at Boston, Mass., with Mathias Lee as diamond setter and foreman of drills.

Fig. 4.—Section through Spindles.

The Treatment of Waste "Pickle."

In England the treatment of galvanizers' waste pickle has been made the subject of experimental tests with a view of neutralizing its deleterious effects. As the result of long and careful investigation, Mr. Thomas Turner, metallurgical lecturer at Mason College, Birmingham, England, has invented and patented a process which promises to achieve the desired ends, and which has been for some little time past in operation at the works of Walker Brothers, Walsall and Netherton. The principle of the process is simple in the extreme. The waste liquor is merely boiled down to dryness, and the solid residue heated to low redness. Oxide of iron remains in the furnace, while free hydrochloric acid distils off, is condensed, and can be used over again *ad infinitum*. But though the idea is thus simple, the practical application of it was a matter which involved costly experiments, extending over many months. The difficulties to be overcome were very great, since the liquor contained so much free acid that to use any metal vessel was quite impossible; nor could it be contained when at boiling heat in any kind of brick or stone evaporating pan. At the same time it yielded, on evaporation, such a large quantity of solid residue that the bottom of any vessel used became covered with a thick deposit after a few hours' working, and this deposit was so hard that it could be removed only by means of a sledge hammer and a crowbar. Even this was not all. The ferrous chloride, when heated in the presence of air, formed a considerable amount of ferric chloride, which, volatizing freely, contaminated the recovered acid. All these difficulties have at length been overcome, and the process has been in succesful operation at Messrs. Walker's works for six months, and has been proved on the large scale to entirely do away with the waste "pickle," and, what is even more remarkable, to yield a clear profit after paying all working expenses.

The ferrous chloride and the waste liquor are heated in one and the same furnace by the reverberatory principle. Much depends upon the regular introduction and distribution of the liquor. The corrosive action of the free acid is avoided by leaving on the brick floor of the retort a coat of the thick deposit above mentioned; the formation of ferric chloride is checked by roasting the residue inaccessibly to air; and the method of working by heat from above prevents the deposit from caking beyond such a depth as is desired. The distilled acid is condensed in a tall stack of special construction; and the oxide of iron remaining is raked out of the furnace in the state in which it is commonly known as "blue billy," and is of use in puddling operations for "fettling." As a result of experience it is found that the furnaces will work three months without stoppage, that they use only 4 cwt. of fuel to completely treat 1 ton of waste liquor, that the acid recovered is perfectly suitable for using over and over again, and that the oxide of iron recovered has a value which goes a long way toward paying for the fuel used.

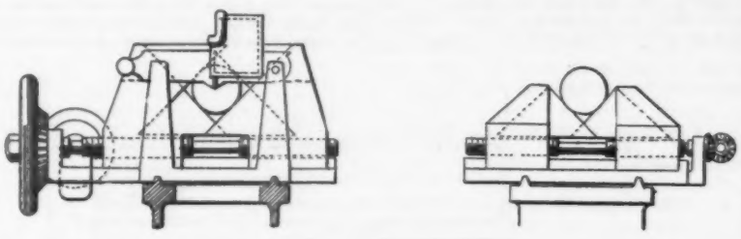


Fig. 5.—Adjustable Rest and Vise.

Analyses of Cranberry Ores.—We are indebted to the East Tennessee Mining and Improvement Company for the following analyses of ores from the Cranberry district:

	Metallic iron.	Phosphorus.	Titanium.
1. Cranberry Mines.....	58.35	0.0071	0.007
2. " "	40.79	0.0767	none.
3. " "	41.13	0.0319	0.012
4. " "	50.77	0.0087	0.013
5. Davis Tract, East T. M. & I. Co.....	45.97	0.045	none.
6. Poplar opening.....	47.88	0.017	none.
7. East Tenn. M.& I.Co.	54.63	0.032	trace.
8. " " "	63.63	0.036	none.
9. Fork Ridge "	55.12	trace.	none.
10. Wilcox "	57.74	0.017	none.
11. East Tenn. "	56.14	trace.	none.
12. " " "	66.39	0.0067	none.

The company, in which a number of prominent Philadelphia iron men are interested, have ore lands in the Cranberry district, and are pushing the claims to greatness of the town of Watauga, Tenn., where it is claimed Bessemer pig iron can be made at $11.

THE MECHANICAL ENGINEERS.

CINCINNATI MEETING CONCLUDED.

Prof. R. C. Carpenter read a paper on

Tests of Several Types of Engines, under Conditions Found in Actual Practice.

The tests were, first, of a simple engine with automatic governor; second, a compound non-condensing engine of the horizontal tandem type having an automatic governor on the high pressure cylinder and a fixed eccentric for the low pressure cylinder; third, a simple condensing engine of the Reynolds-Corliss pattern; fourth, a compound condensing engine, horizontal tandem type, automatic governor connected to both valves; fifth, two compound condensing engines, horizontal tandem type, automatic governor; sixth, two compound condensing engines, with throttling governor, and cut-off adjustable by link motion; and seventh, two triple expansion condensing engines, horizontal tandem type, with automatic governors. The engines were in ordinary working condition and were in no case especially fitted up to be tested. Not one had steam jackets. The paper gives in detail the method of testing each engine, and gives the results in tabulated form.

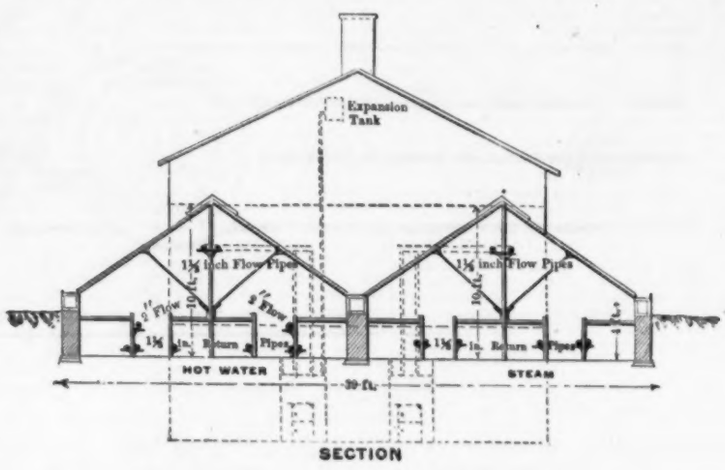
The next paper was also by Professor Carpenter on a

Comparative Test of a Hot Water and a Steam Heating Plant.

These tests were made to decide whether the better method of heating greenhouses was with low pressure steam or with hot water. The buildings were exactly alike, as shown in the drawings, and were erected for the purpose. Each measured 50 x 19½ feet, and contained 1100 square feet of glass. The tests were begun on December 21 last, and were continued until March 20. The average daily coal consumption during December was 75 pounds for the hot water system and 93 pounds for the steam. In January, the average was 90 pounds for the first and 112 for the second; in February, the rates were 99 and 121 pounds, and in March 114 and 136 pounds. The temperature was maintained somewhat higher in the hot water house, and the average range or variation was a little less.

Discussion.

Charles E. Emery said: It is believed that hot water is in general much better adapted for heating greenhouses than steam, on account of its greater specific heat and the greater weight of heated fluid in circulation, which tend to produce equality of temperature. It must not, however, be assumed that there should be any difference in the economy of the two systems. The quantities of heat leaving and returning to the boiler, under the same conditions, when using two different fluids, must of necessity be the same, and such a difference as is shown by these experiments must be entirely due to the difference in the efficiency of the heaters themselves, when used under different conditions. Tracing out in detail the differences in condition, we find, first, that the amount of radiating surface in the building heated with steam was considerably less than that heated with water. This made no difference in the number of thermal units utilized, but required that the average temperature of the steam used in one case should be greater than that of the water in the other. Taking it for granted that the two heaters were exactly alike in all essential particulars, the water heating surface of the one used for steam was necessarily slightly reduced by the necessity of lowering the level of the water to provide steam space. The water and steam were also necessarily at a somewhat higher temperature in the steam heater than in the water heater. These two elements would necessarily increase the amount of coal burned in any steam heater, compared with that in any water heater, when the conditions varied as stated. Moreover, in heaters of the general type illustrated, it is impracticable to control the draft areas so as to force the heated products of combustion over the entire heating surface, from which fact it frequently occurs that a very slight increase in demand from such a boiler causes a great increase in the amount of heat carried away to the chimney.



Vertical Section through Green Houses.

Notes on Kerosene in Steam Boilers

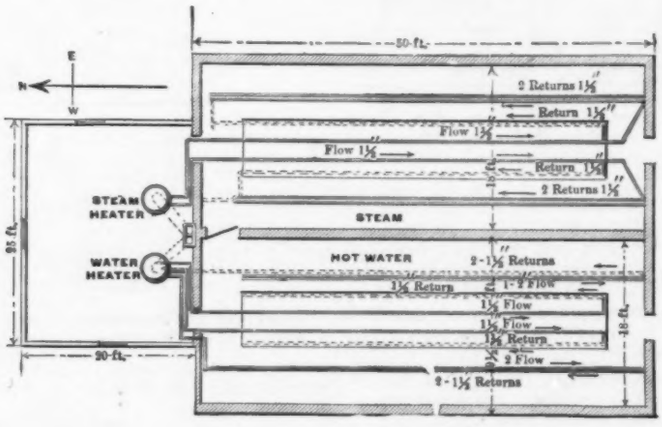
was the title of a paper also presented by Professor Carpenter. The boilers experimented on were of the ordinary tubular type, 12 feet in hight, four being 4 feet in diameter and the other two 5 feet in diameter. When the use of oil was begun the boilers were badly incrusted with a hard scale. The first application of oil was made by inserting about a gallon, then filling the boiler with water, heating to the boiling point and allowing the water to stand two or three weeks before removing. This succeeded in removing fully one-half the scale. This was found to be a more effective way than that of applying the oil in small quantities when the boiler was in use. Kerosene oil was used in this case. It was found that there was no advantage to be derived from the use of more than a certain quantity of oil. For boilers 4 feet in diameter and 12 feet long, the best results were obtained with 2 quarts of oil for each boiler per week. The boilers now have less scale in them than at any previous time within four years, and the small quantity remaining in them seems to be soft and gradually disappearing.

In the discussion which followed the presentation of this paper, C. W. Nason said that in one case, with the use of crude petroleum in a boiler badly scaled, it was noticed that the scales came off in cakes, the oil seeming to enter between the scale and iron, and thereby separating the two. These cakes varied considerably in size, and in some cases were quite large.

Chimney Draft.

Three papers were presented on this subject. Prof. J. Burkitt Webb discussed "Peclet's Treatment of Chimney Draft" and showed that certain parts of the analysis could be advantageously shortened.

The second paper, by Professor Webb, was on "The Mechanical Theory of Chimney Draft." In this paper it is shown exactly how gravity acts in producing the velocity of the hot air in a chimney, and how the heat acts to keep gravity wound up, so to speak. A chimney 330 feet high by 1 foot square section is supposed to be full of hot air, and to be connected at its base with a shaft 100 feet square of the same hight, and full of cold air. It is assumed that the air in the chimney is so hot that its density is but one-half that of the cold air, and that after the air is heated no heat is abstracted by a boiler or lost through the walls. By placing the grate near the bottom of the large cold air shaft it will be so large as to offer no perceptible obstruction to the passage of the air, and the grate bars being supposed to be simply wires heated by electricity, there will be no coals to obstruct the flow, and the heat can be turned on and off by making and breaking the circuit. The cold air shaft having 10,000 times the section of the chimey, and the cold air one-half the density of the hot, and velocity in the shaft will be but 1-20000 of that in the chimney and therefore neglectable. If the chimney be in full draft, and if the current be broken so as to stop the supply of heat, no diminution of the velocity will result until all the hot air, in the connecting passage has passed into the chimney, and as this passage can be made of any capacity, the effect upon the velocity of stopping the supply of heat can be postponed indefinitely, which proves that the heating of the air has no direct effect in producing the velocity. The effect of heating the air is simply to keep raising the cold air in its shaft, which acts as a weight to keep the apparatus running—*i. e.*, to keep the chimney drawing—one-half of this weight being balanced against the weight of the hot air column, and the other half being employed in maintaining the draft. In regard to the production of the velocity, it is supposed that the cold air shaft is extended to twice its former hight, and connected at the top with a similar shaft, opening at the bottom with a grating of wires to heat the entering air. The atmospheric pressure is supposed to be the same at the top of both the hot air and cold air shafts. In such an apparatus the hot grate at the bottom of the second cold air shaft would keep it full of hot air, having substantially no velocity, the action of the heat being to make each cubic foot of cold air 2 feet high, or to expand a column half the hight of the shaft into one of full heat, the weight remaining the same. At the top of this second column there would be a constant flow to the top of the first cold air column, which would be kept full. That portion of the apparatus comprised in the hot air column, its passage and the first cold air column, would be devoted to producing the velocity of exit at the top of the hot air column, and this velocity would be that due to the difference in hight of the hot air column in the first large shaft, over that of a column of cold air of equal weight. The formula for the velocity is then given as velocity = $\sqrt{2g\,(AD)}$, AD being this difference in hight.

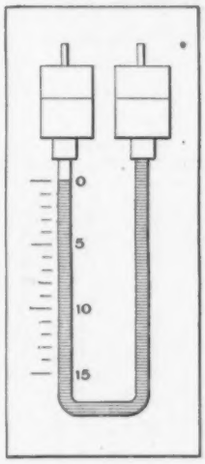


Plan of Green Houses.

The third paper on chimney draft, by Prof. De Volson Wood, appeared to be called forth, as explained, by the appearance of certain criticisms which are often repeated and apparently involve valid reasoning as to the accuracy of Peclet's hypotheses, and it is upon these subjects that his discussion is founded.

Discussion.

George H. Barrus made a drawing on the blackboard of the gauge he had found to work admirably and described it as follows: It consists essentially of an ordinary U-tube, made of glass, surmounted by two chambers. The tube is about ¾ inch diameter, and the chambers 2 or 2½ inch diameter, depending upon the amount of magnifying desired. One chamber and the tube on one side of the zero mark are gilded with oil, and the other chamber and the tube on the other side of the mark are filled with colored alcohol, the upper portions of the chambers being empty and open to the air through the small tubes. On connecting the appropriate chamber with the flue of the boiler or chimney, the heat of the liquids in the chambers is varied in about the same proportion as that in the ordinary U-tube gauge. The line of demarcation between the two different colored liquids in the glass tube, however, is moved a much greater amount, depending upon the relation which exists between the diameter of the glass and that of the chamber. A draft of 1-10 inch, measured in the common



Barrus Draught Gauge.

way, can readily be multiplied by this means so as to give a movement of five or even ten times this amount on the scale of the instrument. The scale is calibrated by reference to a common U-tube containing water when giving an indication of one or perhaps two inches.

Another paper by Professor Wood was on the

Graphic Representation of Thermal Quantities.

The geometrical representations of thermal quantities are of great assistance in forming mental conceptions of the changes which take place in fluids, due to changes in the heat to which they are subjected and especially furnish a means of illustrating the algebraic expressions, which occur in the study of thermodynamics. The writer was the first to represent on a diagram of energy internal work, and the present paper extends these representations to some cases not before given. The representations, which are completely worked out, are founded on the following theorems:

"The mechanical equivalent of the heat absorbed or given out by a substance in passing from one given state (as to pressure and volume) to another given state, through a series of states represented by the co-ordinates of a given curve on a diagram of energy, is represented by the area included between the given curve and curve of no transmission of heat drawn from its extremities, and indefinitely prolonged in the direction representing increase of volume."

"If a fluid be worked through a series of changes (as to pressure and volume) from any given state back to the same state, the resultant internal work will be zero"

Another paper by Professor Wood was on a "Test of a Refrigerating Plant." The test was made upon a nominal 110 De La Vergne refrigerating plant. The paper describes in brief the general arrangement of the plant, which was of the same pattern as that which we described in *The Iron Age* of May 8, 1890. The method of obtaining the weight of ammonia used was then shown, the refrigeration, the boiler plant, &c. Investigation showed that the ice melting capacity per indicated horse-power per hour was 65.79 pounds.

Prof. R. H. Thurston, in a paper entitled "Hirn and Dwelshauvers' Theory of the Steam Engine, Experimental and Analytic," gives a brief and comprehensive *resumé* of the work done by these great inventors. The paper is of value as giving the dates of publication and a brief outline of the work done by the two.

A Universal Steel Calorimeter

was described by Geo. H. Barrus. In experimenting with his superheating calorimeter he found that where the quality of steam was being tried, the steam being very wet, a device was planned for passing steam first through a chamber in which some of the moisture would be deposited, thereby relieving the instrument from handling so much water and increasing its range. The use of such a device in connection with the superheating form of instrument will enable any desired amount of moisture to be measured by the instrument and overcome the objection of limited range. This method of treating a part of the moisture in wet steam has been perfected in the apparatus described, but in place of using a superheated calorimeter for determining the remaining quantity of moisture, recourse has been had to the wire drawing principle. The apparatus is so constructed that a continuous current of steam passes through it, the rate of this current being constant so long as the pressure is constant. A drip box is provided for retaining the condensed water, which can be drawn off through a suitable valve into a bucket resting on scales. The quantity drawn off is regulated so as to keep the water at a constant level in the drip box. It has been found that the use of the drip box almost entirely removes the water from the steam, leaving very little moisture to pass over into the heat gauge. When the amount of moisture drawn off from the drain valve has been determined for a given time, the percentage of moisture which this represents is found by comparing it with the total amount of steam passing through the apparatus. This is done either by computation or by trial. The paper concludes with a number of tests made with the instrument on different boilers, which show not only the utility of the apparatus, but also the general manner in which it operates in practice.

Heating Furnaces.

was the title of a paper presented by D. K. Nicholson. A Siemens furnace will probably call for less repairs than any other kind of a reverberatory furnace. The gas and air come up separate ports, and do not unite until they reach the hearth, when they come in contact with the metal to be heated. By the time the flame reaches the outgoing ports, it is pretty well spent and does very little injury to the brickwork. In the Smith furnace the regenerators are built in the ends of the furnace. The checkers are entirely open at the top, and on a level with the bridge of the furnace, which is at the same time one wall of the gas chamber. This furnace is generally used for quick heating. Its advantages are: the cheapness, the ease with which the checkers can be taken out and cleaned, and the bottoms of the gas and air conduits and the checker chambers are so little below the surface that they are not likely to become choked by water in low ground. It is better to have the bottom slope toward one tapping hole than toward two or three. The process of burning down a high bottom is injurious to a furnace, since it is necessary to raise it to such a high temperature that the bricks in the roof drip. A sand with too much clay in it is liable to cling to a piece of steel all through the rolls, and show in yellow streaks on the finished bar. A low carbon steel stands nearly as much heat as iron, but in heating high carbon steel the metal must be very carefully brought up to a heat sufficiently high for rolling it. To charge cold steel of high carbon into a warm furnace is disastrous to the metal, particularly when the steel is frosty. It is an easy matter to build a wood fire around the steel and warm it throughout to at least 200° or 300°. The furnace crown that gives the most satisfaction is a roof that dips about 5° at each end for one quarter the whole distance, and then straight across, with the necessary arch sideways for support. A very rough crown obstructs the draft across the furnace, and unevennesses create eddies. By exposing a piece of steel to too high a temperature in the furnace a crystalline structure is induced, which renders the metal unfit for further hammering or rolling. This can be partially remedied by lowering the temperature to a point below that at which it is generally worked and gradually bringing it up again to the right degree. The most common way of doing this is to pass a highly reducing flame over the hearth. Various plans are put into practice to aid in burning the smoke and gases driven off a green fire, but are generally abandoned after a time. Explosions are prevented, in starting up a gas furnace, by building a fire on the hearth to heat the regenerators and surely ignite the gas as soon as it flows out of the port and mixes with the air. Vertical or pit furnaces are only used to reheat ingots brought to them soon after being cast. They save labor in charging and drawing, but are not equal to horizontal furnaces for heating an ingot evenly. The greatest stumbling block to be contended with in their work is the getting rid of the cinder. Soaking pits, of course, require no fuel, and the ingot is handled with more speed and ease than even in the pit furnaces. In a soaking pit the ingot must be charged very soon after it is cast, so that there will be heat over and above what is necessary to give a uniform heat to the ingot, to furnish heat for that which is lost from the sides of the pit. In ordinary running at least 90 per cent. of the ingots from the Bessemer could be cared for in soaking pits.

A paper on "Equilibrium Arch Curves," by H. H. Suplee, described a method patented by T. J. Lovegrove, which will give in a simple and direct manner the proper equilibrium curve for any arch of given span, rise and load with a degree of accuracy which is such a close approximation to rigid exactness as to be entirely within the limits of the errors of construction.

T. C. Clarke described "The Kinzua Viaduct," a structure on a branch line of the Erie Railroad, which was built in 1882, and attracted much attention at the time on account of its unusual hight (300 feet) and the method pursued in its erection. The paper describes the viaduct and briefly touches upon how it was built, but is more particularly devoted to the test of a piece cut from one of the columns after eight years' service. The specimen was taken in order to show the worst condition existing in the viaduct, and was from one of the longest columns. The specimen taken was entirely free from corrosion or any other signs of deterioration. The paint was in as good condition as when first put on, and where it was chipped off at the edges by the cutting tool, the iron showed a perfectly clean, new surface.

"Length of an Indicator Card" was the title of a paper presented by Professor Webb. At the last meeting Professor Webb called attention to the fact that the motion of an indicator drum is governed by the same law that controls the motion of a simple mass attached to a spiral spring, and also that the drum and its spring have their natural time of vibration which could, if desirable, be made variable at will. The amplitude of the drum motion was also touched upon, and it was shown by a simple arithmetical argument that if the engine forces the drum to oscillate in less than its natural time the amplitude of its oscillation will be increased by an amount dependent on the elasticity of the cord or other connection; and, in the same way, if the time be made greater the amplitude will be decreased. The present paper continues the subject by taking up more at length the question of the change of amplitude.

Prof. D. S. Jacobus read a paper on

Indicator Cards of the Pawtucket Pumping Engine.

the object of which is to compare the law of expansion of the steam and the economy obtained when working with and without jackets, and to show if the indicator cards taken by different persons at various times will lead to the same conclusions. The engine was run continuously for 21 days under the following conditions:

1. Seven days with jackets and the reheater in use. 2. Two days with jackets shut off and flue reheater in use. 3. Five days with both jackets and flue reheater shut off.

The notes obtained were very complete, readings of the important quantities being taken every hour and in some cases every half hour.

The conclusions arrived at are: 1. The effect of jackets on the form of the expansion curves of both the high and low pressure cylinders is so small that the errors involved in the most accurate measurements of the indicator diagrams make it impossible to show any difference in the laws governing the same. 2. The economy of the plant when working under the three sets of conditions is about 1.7 per cent. in favor of using the flue reheater, and 2.5 per cent. in favor of using both jackets and flue reheater over that obtained when neither the flue reheater or jackets are used. The duty for both jackets and flue heater in use was 121,560,000 foot pounds per 100 pounds of coal. 3. There was very little re-evaporation during expansion in either the high or low pressure cylinder, the average for all the tests being 0.4 per cent. for the high cylinder, and 2.9 per cent. for the low.

Another paper by Professor Jacobus was on the

Effective Area of Propeller Screws.

The measurements obtained covered the work of four screws, and are regarded as valuable instances of the verification of the statement

made in Rankine's *Shipbuilding*, that "The effective area is the sectional area already mentioned of the stream of water laid hold of by the propeller, and is generally, if not always, greater than the actual area, in a ratio which in good, ordinary examples is 1.2 or thereabout, and is sometimes as high as 1.4, a fact probably due to the stiffness of the water, which communicates motion laterally among its particles."

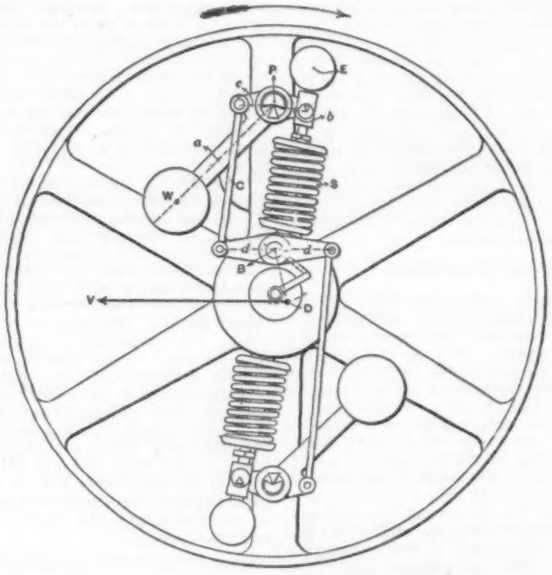
In the remarks made after the reading of the paper it was shown that in order to obtain reliable information regarding the performance of screws it was absolutely essential to accurately define the material, the sharpness of the edge, the smoothness of the surface, and to obtain the measurements from the screw itself. This is necessary, simply because the drawings of the screw by no means give data corresponding with the completed screw, and unless all the points are taken from the screw as run the foundation upon which the conclusions are erected will be wrong.

E. J. Armstrong read a paper on "A Use for Inertia in Shaft Governors," in which it is shown that inertia, usually a disturbing element, can be and is made the reverse, even to performing the functions of a dash pot.

A Governor for Steam Engines

was described by Jesse M. Smith.

A small shaft, B, is journaled in the hub of the fly wheel and is parallel to the main shaft. The eccentric, whose center is at D, is fixed to one end of the shaft B and the cross arm *d* to the other. The center of the eccentric may thus move about B, across the shaft and produce the variable valve motion. Each end of the cross arm *d* is connected by a link C to an arm *c*, pivoted at P. The flying weight W fixed to the arm *a*, also pivoted at P, tends to move outward as the speed increases. It is resisted by a weight, E, acting on the arm *b*, also pivoted at P, which moves inward when W moves outward. The spring S, whose axis is radial, also acts on arm *b* and assists the weight E to urge W inward. The valve resistance V also assists the weight E. The arms *a b c* are all formed in one piece. The weights W and E and spring S move as nearly as possible upon radii from the center of rotation. For the purpose of reducing the friction to a minimum, the pivot P, which sustains the greatest strain, and the bearings at the ends of arms *b*, are made in the form of knife edges of hardened steel. They require little or no oil and are inclosed so as not to gather dust. The joints of the links C support little strain and are usually made simple pin connections. The eccentric being mounted on the small shaft B, which has a long bearing in the hub of the fly wheel, requires little force to move it. The shaft B may, besides, be oiled while the engine is running, by means of a small pipe extending from the center of the main shaft to the middle of shaft B, so that the friction here is also reduced to a very small amount. This governor is readily adapted to run in either direction.



STEAM ENGINE GOVERNOR.

Discussion.

Professor Thurston said that in order that the governor may act promptly, powerfully and accurately, it must include some adjustment to insure the quick moving of its parts into the required position, and to evade the ill effect of inertia. This can be accomplished by the use of a dash pot, offering rapidly augmented resistance with increasing velocity of displacement. In the form of governing here described I see what appears to me a useful arrangement which will give a similar effect. The weight is so suspended that any quick movement of the engine will jerk the wheel ahead or back, accordingly as the load is dropped off or thrown on, in such manner as to produce, in consequence of the inertia of the weight, a relative motion of the weight and the other parts of the governor, which must result in quick closing or quick opening, as the case may be. The substitution of knife edges for pins and joints of the usual sort is an important modification in the direction of improvement, and especially as insuring a constant and permanent sensitiveness. I should expect thoroughly good work from the governor here described.

Prof. John E. Sweet said: "The author of the paper, in his third proposition, says: 'In order that the shaft may not be thrown out of balance by change of position of the governor weights these weights must be symmetrical.' It so happens that this statement is not true. In a single ball governor, if the weight of the eccentric and its attachments balances the governor ball, and moves in the opposite direction on a line through the center of shaft, it will balance it in all positions. Even were this not true in the single cylinder engine, the unbalanced weight of the reciprocating parts exceeds the weight of the governor ball, as perhaps ten to one, so that the unbalanced single ball at its worst would be unnoticeable in the engine. As direct evidence, we run the single ball governed engine at all speeds while resting on a greased iron plate without any fastenings whatever, and without any evidence that the single ball disturbs the balance. Were all the balls concentrated into one, its inertia would be equally efficacious in resisting the dissurbing influence due to friction of valve; and as the one weight would have a greater range of motion than the average of the four, likely it would be more serviceable than in the form shown. The best part of the paper is the statement that 'the governor works well,' which I am ready to believe (if the weight E is small enough), as I am that there are others that work well also with fewer pieces."

Effect of an Unbalanced Eccentric or Governor Ball on the Valve Motion of Shaft Governed Engines

was the heading of a paper by Prof. John E. Sweet.

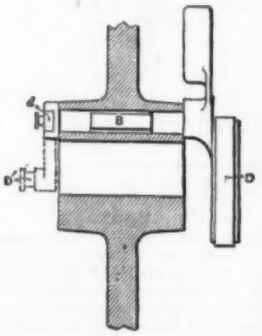
The fast growing family of steam engine governors, known as shaft governors, can be divided into two classes. In one class, the eccentric is forced over, through the agency of some wedging action, such as a secondary eccentric or slide. In the other class, the eccentric is pulled or pushed, by the force of the governing weight direct. The advantage of the first class is that any resistance in the valve does not recoil on the governing weight, and hence affect it, and the disadvantage is that the extra friction impairs its sensitiveness. The advantage in the second class is that of possible sensitive governing: and the disadvantage of being easily disturbed by external influences. Something like a year ago E. J. Armstrong, of this society, had an aggravated case of valve disturbance in an engine well suited to experimenting; and as a matter of investigation, he fixed a pencil in the eccentric and obtained a diagram. His belief that the distortion of the eccentric curve must have been caused by the unbalanced eccentric led him to the consideration of the effect of gravity on a weight, working under the condition of an unbalanced governor ball.

To put this problem in its most simple form, what will be the effect of gravity on an unbalanced governor weight? Assume that the ordinary fly wheel has arranged within it a weight, free to move radially, and held in, against centrifugal force, by a spring. With the spring properly proportioned to a given speed, given the proper initial tension, and the wheel maintained at that speed, the tendency of the ball to go out by centrifugal force and the tendency of the spring to draw it in will exactly balance each other, wheresoever the ball may be placed. So that, were it not for the disturbing influence of gravity, the ball might be set anywhere out or in, and would there stay, so long as the constant speed of the wheel was maintained. The ball starting horizontally opposite the center, it was found to be affected by gravity which drew it away from the center until it reached a point diametrically opposite, and upon the return to the starting point it was drawn toward the center. The path is not a circle and its center is directly to one side of the wheel center.

An Open Mercury Column for High Pressures,

designed to give pressures from atmospheric to 200 pounds per square inch, or higher, was described by W. W. Bird.

Referring to the drawing, AA is a small iron tube connected at the lower end with the glass tube B, which in turn is connected by a flexible tube, C, with the gauge or gauges GG. They are fastened to the carriage D, which runs on the rod EE. The tube AA in this case is made up of four sections, each section being of sufficient length to give a pressure of 50 pounds when filled with mercury at 62° F.



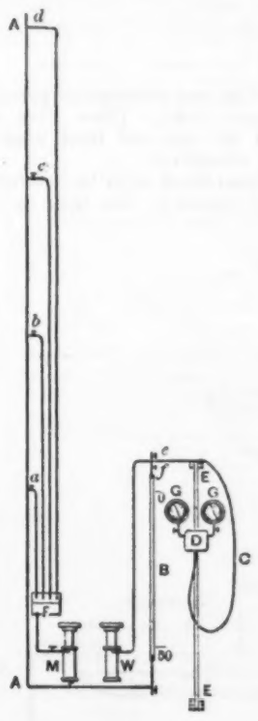
The method of operating is as follows: By means of the pump M mercury is forced into the column. It rises in both the iron and glass tubes, the cock *e* being open. When the mercury in the iron tube reaches the end of the first section it passes through the valve *a* and down an overflow pipe to the collector F. This fixes the zero mark on the scale. Water is then put in at the top of glass tube by means of the pump W, and fills the top of the glass tube and the flexible tube C. Closing the cock *e*, more water is forced in, and the mercury in the glass tube is displaced, thus forcing more into the iron tube, the result being an overflow at the valve *a*. Thus the mercury can be lowered to any desired reading between 0 and 50, while the level in the iron tube remains the same, the gauges being moved up or down to correct for the column of water. The operator at any time can easily assure himself of the level of the mercury in the iron tube by forcing in more mercury until some comes down the overflow.

When pressures from 50 to 100 pounds are desired, the gauge is corrected or its correction noted, if any, for 50 pounds, by the first section, the valve *a* closed and mercury forced in until it comes down the overflow from the valve *b* and stands at 0 in the glass tube, the water having been returned to the pump or allowed to escape. The gauge being brought to the proper place, the reading should be 50, or show the same as at the end of the first section. This gives a means of checking the measurement of the tube from *a* to *b*. The operation is now the same from 50 to 100 as from 0 to 50. And by closing the valves *b* and *c*, pressures from 100 to 150 and 150 to 200 are

obtained. More sections can be added if higher pressures are desired.

Discussion.

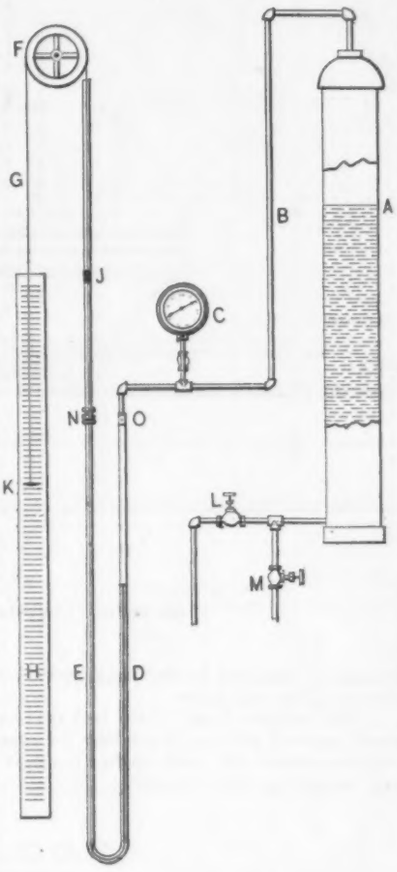
Professor Jacobus said: In connection with the mercury column described by Mr. Bird I wish to illustrate one that is now in process of construction at the Stevens Institute of Technology. A column involving the same feature as the one I wish to describe was designed by Francis B. Stevens; this has been in use for many years and given entire satisfaction. The column at the Institute is designed as follows: E and D are two wrought iron pipes of about ½ inch internal diameter, containing mercury. A is an air reservoir from which compressed air is led through the pipe B to the upper end of the pipe D. When the air in A is not compressed above the pressure of the atmosphere the mercury in the pipes E and D is at the hight indicated by two lines marked on the small glass disks N and O. J is an iron float resting on the mercury in the pipe E. A silk string, G J, crosses from this weight over the pulley F and supports the index K, which slide along the scale H. L is a valve for admitting water to the reservoir A and M a valve for releasing the same. The method of operating the column is as follows: The gauge to be tested is placed at C. Water is admitted to the reservoir A, thereby causing compression of the air above it. This compressed air acts on the gauge, and on the top of the mercury in D, thereby causing the mercury in D to fall and that in the tube E to rise. The amount that the mercury uses in E is shown by the position of the index K. In the instrument designed by Mr. Stevens the tubes E and D were made of precisely the same bore, so that the amount that the mercury was depressed in D would be the same as the amount that it was elevated in E. In the column at the Institute this refinement has not been gone into, for which reason the following method will be employed in graduating the scale H. A gauge



Mercury Column for High Pressures.

is taken to one of the standard makers, and compared with a mercury column used by them. This gauge is carried back in a careful manner, placed at C, and employed in obtaining the graduations on the scale H. After graduating H the gauge is again compared with the standard mercury column. If it still agrees with the standard it may be assumed that it was correct at the time that the scale H was graduated. After this second comparison with the standard the gauge is again placed at C, and the graduation of H verified. We thus obtain a column that when once standardized may be used for testing other gauges. The arrangement of the silk thread leading over the pulley F has been found to give entire satisfaction in the case of several mercury columns now in use, so that there need be no apprehension that it will give trouble by stretching. The advantage that this gauge has over many others is the ease with which it may be used, there being no complicated adjustments or connections required. The scale H is only one-half the length of one that must be employed in a column having a single mercury tube, and for this reason it is much more easy to provide means for reading it along its entire length.

"An Automatic Absorption Dynamometer" was described by George I. Alden. This device was constructed because of the desirability of maintaining a uniform load upon an engine used for tests, of measuring the power developed and of automatically registering the rate at which energy is absorbed. This dynamo-



Mercury Column for High Pressures.

meter is essentially a friction brake, in which the pressure causing the friction is distributed over a comparatively large area, thus giving a low intensity of pressure between the rubbing surfaces. The pressure is produced by the action of water from the city pipes.

The report of the committee on a standard method of conducting duty trials of pumping engines, composed of Geo. H. Barrus, A. F. Nagle, Edwin Reynolds, J. J. de Kinder and J. S. Coon, was very elaborate and covered completely an entire method. The committee took it for granted that the scope of its work extended over the whole field of duty trials, and was not confined simply to making the tests. The report is an exceedingly valuable one, and one likely to become standard.

Testing Locomotives.

A committee, consisting of Charles B. Richards, Wm. Forsyth, H. B. Stone, J. E. Denton, Alex. Vogt, Allan Sterling and F. W. Dean, was appointed to determine a standard method of testing locomotives and to compare the relative efficiency of simple and compound locomotives.

Sometime since our attention was called by C. L. Hopkins, assistant pomologist of the United States Department of Agriculture, Washington, to the fact that trouble was experienced by fruit packers through the effect of acids upon the galvanized wire of the shelves on which the fruit was dried. A suggestion was made that possibly phosphor-bronze wire might overcome the difficulty, but experienced manufacturers of phosphorus bronze admitted that exposure of it to fruit acids would probably lead to corrosion. Two other suggestions, however, have been made which may overcome the trouble and avoid the danger incident to the present system. One of the suggestions made by Merchant & Co. was to use iron wire heavily coated with tin, commercially known as double extra coated tin wire. The second suggestion was to use wire cloth made of pure aluminum, a metal upon which fruit acids would have no effect. We are informed by the Gilbert & Bennett Mfg. Company, of Georgetown, Conn., that large steamers of aluminum are now being made for fruit evaporation, and that Cross & Blackwell, of London, are using aluminum dishes for cooking utensils for fruits and are using aluminum kettles for jellies. The comparative cost of aluminum wire cloth of the proper weight for drying fruit would be about nine times that of the ordinary galvanized cloth. While this would make the first cost apparently high, the safety and the long life of it would counterbalance the heavy first outlay.

BIRMINGHAM NOTES.

Steel making continues the principal topic of conversation in industrial circles, and the success of the Henderson Company's experiments is no longer doubted even by the most skeptical. The Henderson Company yesterday made a contract for the erection of another plant which will be a duplicate of the present one. Work will begin next week and the new plant will be finished in 90 days. This will give the company a capacity of 60 tons of steel per day. If the steel continues to find ready sale at market price a much larger plant will be erected by the company before the end of the year.

There is great activity in industrial circles in this district just now. Work has begun on the car works at Bessemer, and contracts have been awarded for the erection of buildings for large pipe works of the Shickle, Harrison & Howard Iron Company at the same place.

The Georgia Pacific Railroad Company have closed a contract with the North Birmingham Land Company for the erection of large shops and car works at North Birmingham. The present shops of the road employ about 500 men, but the new works will give employment to something like 1500 men.

Richard Church is putting in new machinery and will double the capacity of his edged tool works.

There is also much activity in mining operations. By the opening of new slopes, the daily output of the Pratt mines has been increased to 5000 tons per day. A new coal mine, with a capacity of 400 tons, is being opened at Clements, in Tuskaloosa County. New slopes have been opened at the Horse Creek mines in Walker County, and the output increased to 800 tons.

A syndicate of Boston, New York and New Orleans capitalists, which recently purchased a large tract of coal land in Walker County, has let contracts for the opening of mines, and work has commenced in earnest. They expect to be mining 1000 tons of coal per day by October or before. Several hundred coke ovens will be built also.

The new machine shop of The Link Belt Machinery Company, at Chicago, Ill., will be of iron designed and built by The Berlin Iron Bridge Company, of East Berlin, Conn. The building will be 121 feet wide. The central portion will be 40 feet wide by 42 feet high, with a traveling crane running the entire length. The wings will be 40 feet in width and two stories high. A hydraulic crane will cover the entire central portion of the building except for a distance of 30 feet from one end, which will be used for offices.

Sixteen-Inch Gun Lathes for Washington Navy Yard.

[*With Supplementary Sheet of Engravings.*]

Upon the completion of the lathes of which we herewith present drawings, showing the most prominent features, the Government will be enabled, in its own shops, to build guns of the largest size. Lathes for building 8 to 12-inch guns are now being constructed, and upon completion will be placed in the Watervliet Arsenal. The larger lathes will be placed in the ordnance gun shops of the Washington Navy Yard, in one end of the building now used for the making of guns of smaller size. The shrinking pit has been finished and a Morgan crane capable of handling a load of 150 tons is now being erected.

The drawings we here present were revised and modified by Mr. Miles, of the firm of Bement, Miles & Co., and may be said to embrace the best ideas of Europe to be found in such tools, changed and improved to accord with American practice. Our description we take from the specifications accompanying the drawings.

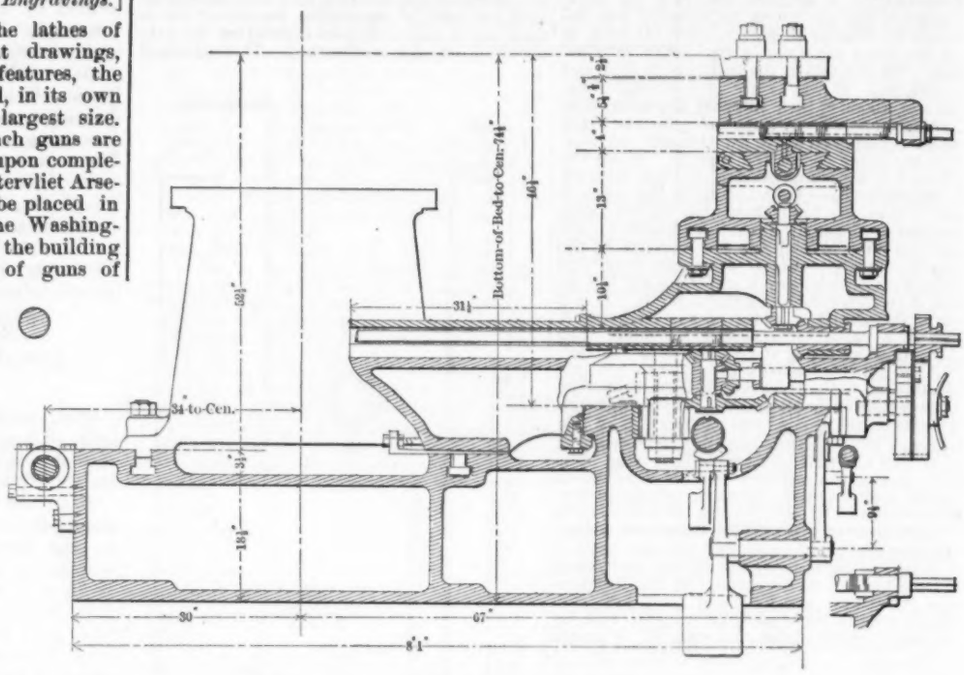
The bed plates consist of a main bed 69 feet long, made in not more than three sections, accurately fitted, keyed and bolted together, and a boring bed 56 feet 2¼ inches long, in not more than two sections, bolted together and to the main bed, to which it forms an extension for supporting the boring bench.

To the head stock end of the main bed are attached, on the front side, the swing frame, brackets, reversing gear, gear cones, change gears, &c., for the traverses of the turning carriages, and on the opposite side those for the traverses of the boring bar. The steel lead screw is contained in the raised portion at the front side of the main bed, upon which the carriages traverse. Outside and in front of the main bed is another smaller screw for the quick movement of the carriages, which is operated by a pulley at the headstock end. Both these screws are supported by tumbler bearings midway their length. The forged steel feed rack is also in this raised part of the bed, and is carefully planed, cut, jointed, fitted and fastened to its place in the best manner.

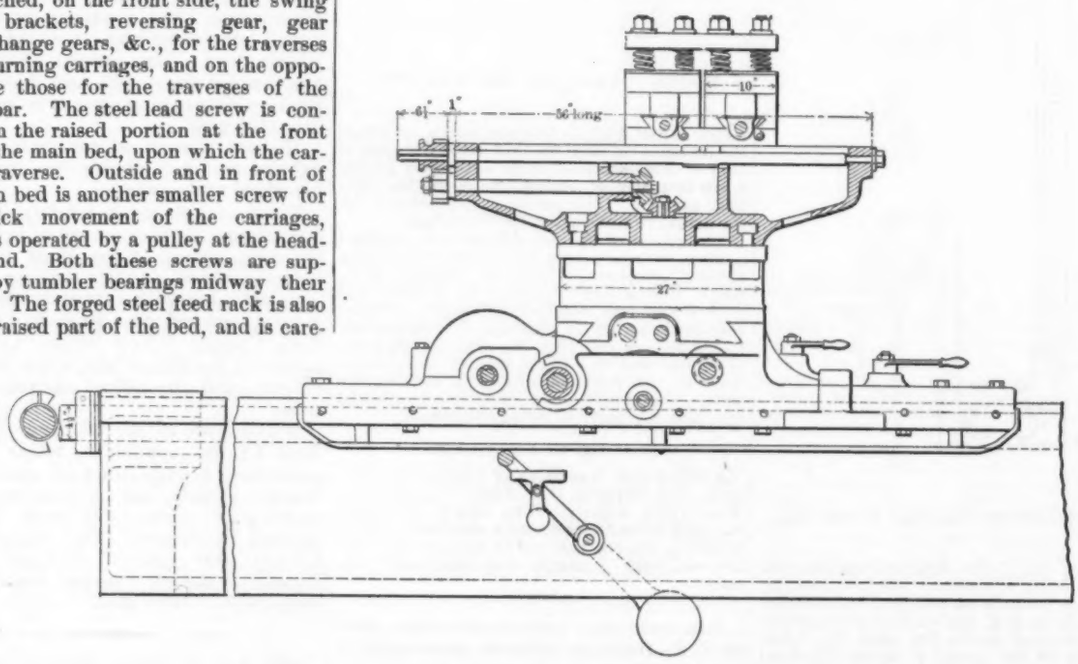
The lead screw, in addition to operating the nut for screw threads, also actuates, by means of a keyway along it, the gearing for the traverse of the carriage and cross feed. By this arrangement the four quick changes of feed by the gear cones are available both for the screws and rack traverses. The lead screw is 1 inch pitch, and, with the change gears arranged for five reductions per turn of spindle, gives, with the gear cones, 1, 2, 3 and 4 tenths pitch of threads; also, by means of the rack traverse, 5, 10, 15 and 20 hundredths of an inch feed. Any other traverses required are obtained in the usual way by changing the end gears.

At the headstock end of the bed are two small grooved pulleys for guiding the rope which operates the belt shifter for starting, stopping and reversing the lathe. Along the front of the bed at intervals are similar guide pulleys, and at the end next the boring bench a larger pulley is placed, governed by a hand wheel, for the convenience of the operator while boring. The shafts for the boring bar traverses are arranged in brackets at the back of the bed. and cones of gears, back gears, clutch The pulleys for feeding the bar and reversing are placed near the junction of the main and boring beds. At the extreme end of the boring bed a pulley is placed upon a screw contained within the boring bed, for moving the boring bench by power. The upper surfaces of the main and boring beds have T slots truly planed in them, for guiding and bolting the boring bench and steady rests. These slots must be finished all over and their upper edges slightly chamfered.

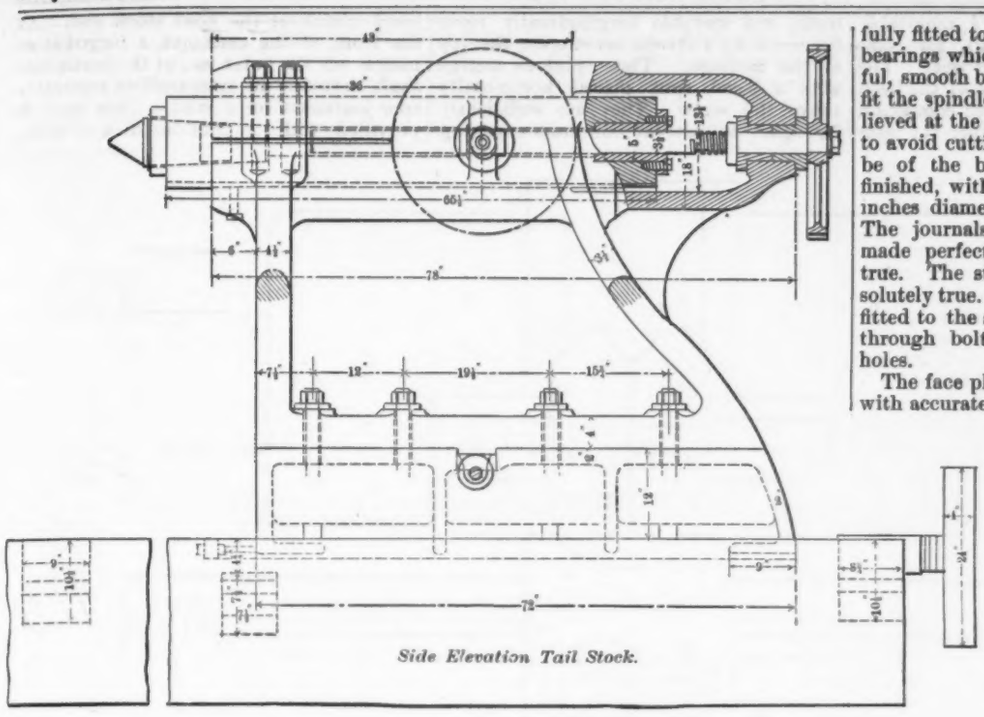
The head stock is to be carefully fitted into and bolted to the bed, so that the spindle may be in perfect alignment with the bed and the boring bar and exactly at right angles to the cross traverse of the carriage A cross web of metal, 1¼ inch thick, separates the central core from those of the front and back standards, which support the journals of the spindle, making, with the two end ones, four cross walls or webs. The journal boxes and bushings to be of best gun bronze, care-



Cross Section, Carriage and Bed.



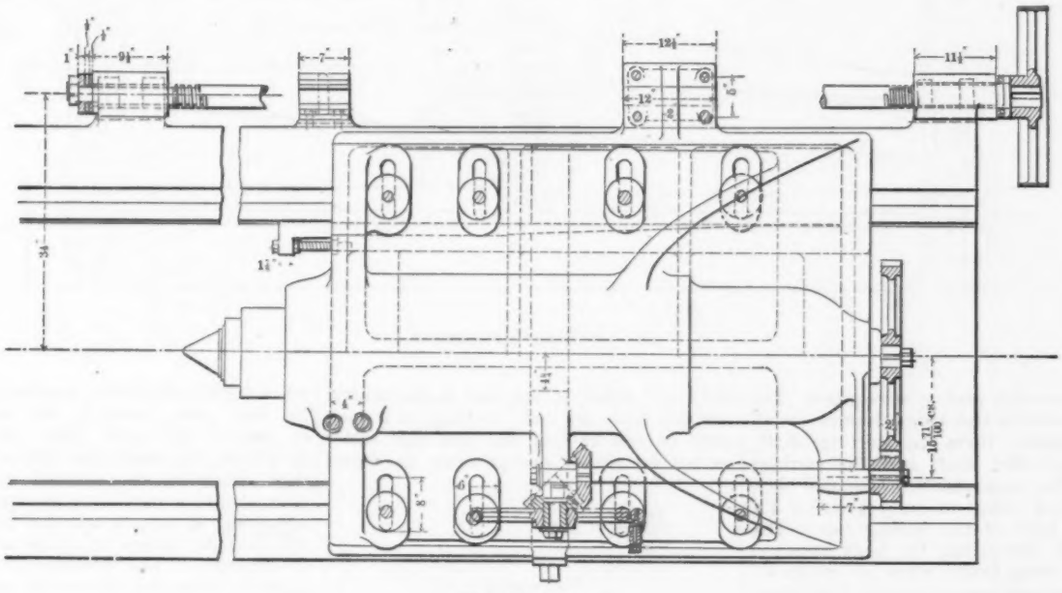
Side Elevation of Carriage.



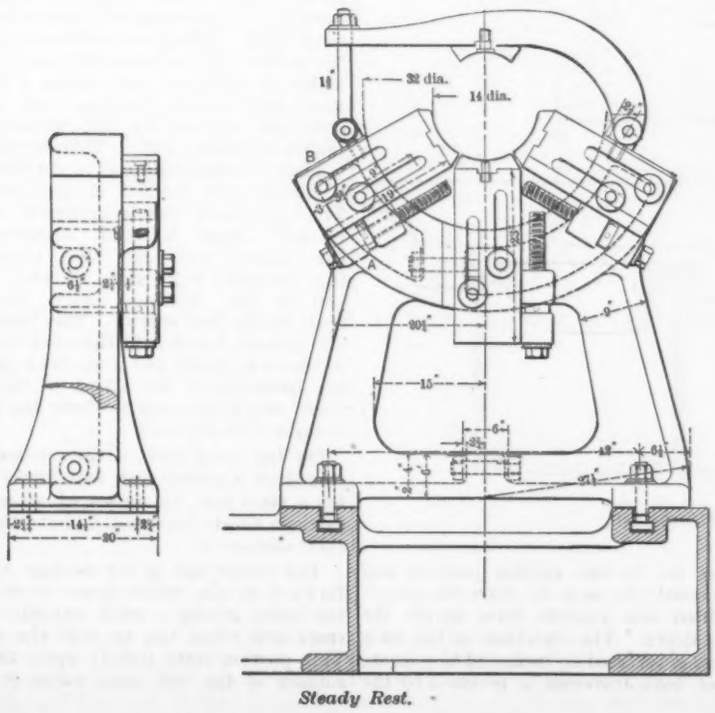
Side Elevation Tail Stock.

fully fitted to the castings and also to the bearings which run in them. After careful, smooth boring, they must be scraped to fit the spindles accurately, but slightly relieved at the partings, on the center line, to avoid cutting. The main spindle must be of the best forged steel, accurately finished, with an axial hole of at least 3 inches diameter throughout its length. The journals to be ground, or otherwise made perfectly cylindrical, to run dead true. The steel center must also run absolutely true. The face plate to be correctly fitted to the spindle and fastened by four through bolts, with driving fits in the holes.

The face plate gear to be of forged steel, with accurately cut teeth, and secured by well-fitted screws. The face plate chuck-slides and pistons are of cast steel; the screws, worm wheel and worm screw, as well as the facings of the piston jaws, are of forged steel, as per forging drawings. The chucks must open sufficiently to grasp a diameter of 57 inches. The cone of head stock will be bushed with best



Plan Tail Stock.



Steady Rest.

gun bronze, perfectly balanced and finished in the best manner known to the art. The cone pinion to be of cast steel. The back gear spur, of cast iron, is fastened by bolts, which act as safety pins, to a flange on the back gear sleeve, which is of cast steel and has the back gear pinion cast upon it. This sleeve is also bushed with bronze. The back gear shaft has cast iron eccentric bushings keyed upon its ends, one of which carries a worm wheel for throwing in and out of gear. The cone spur is of close, tough cast iron, keyed upon the shaft in the usual manner and provided with the usual cone lock, which plays into eight or more slots in the cone. The face plate pinnion, of forged steel, with cut teeth, is also keyed on in the usual way.

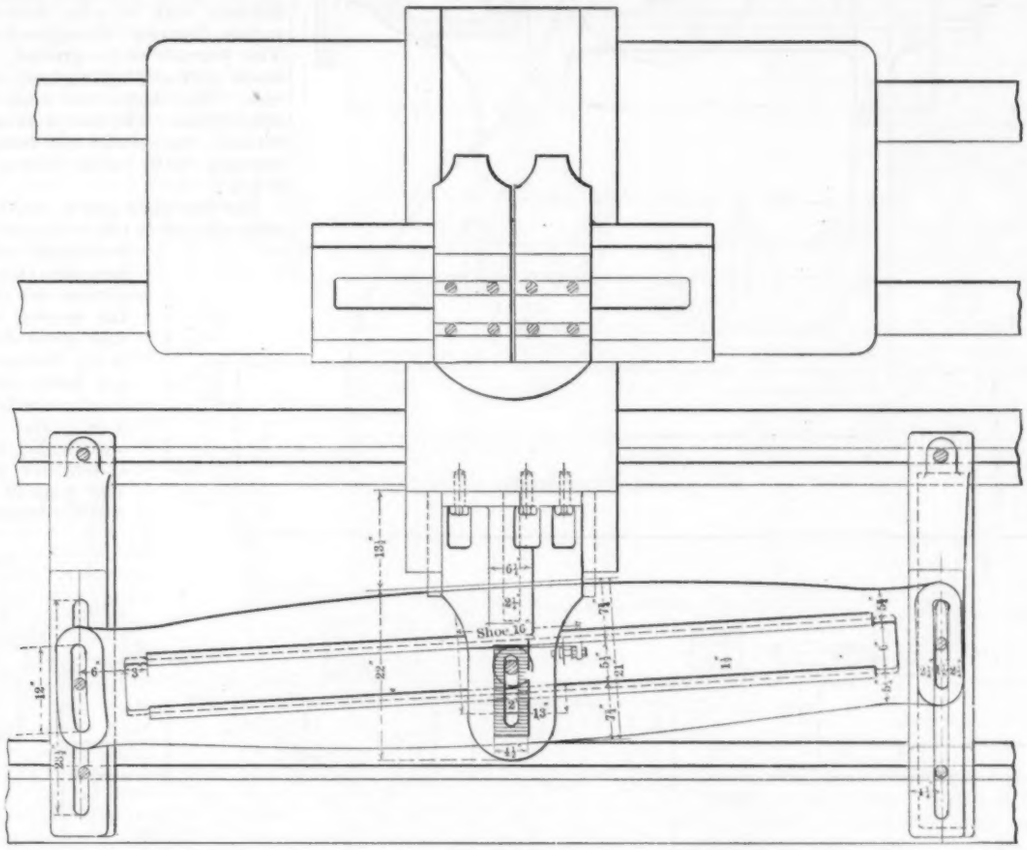
The step screw for the end thrust of spindle is of cast steel, and held in a cast steel yoke fastened by four bolts to the back of the head stock. It has a forged steel hardened facing, which bears against a loose, hardened steel, washer, of slightly oval shape, and this against another straight hardened washer, driven lightly into the end of the spindle, which is recessed to form an oil chamber. A leather ring may be used, if desired, to retain the oil. A forged steel feed pinnion is keyed upon the end of the spindle, which engages an intermediate wheel, and this

again drives a spur with a removable pinion, on the starting shaft, for compounding the screw and feed gear. The swing frames upon either side of the head stock may carry either simple or compound gearing, and may engage either the spur or the removable pinion, as required. The change gears for the swing frames are all interchangeable upon the starting shaft, the boring feed shaft and the carriage screw. The cone spindle is extended back of the head stock, to carry a pulley for the belt feed of the boring bar. The pulley and pinion may be easily removed from the swing frame when not required.

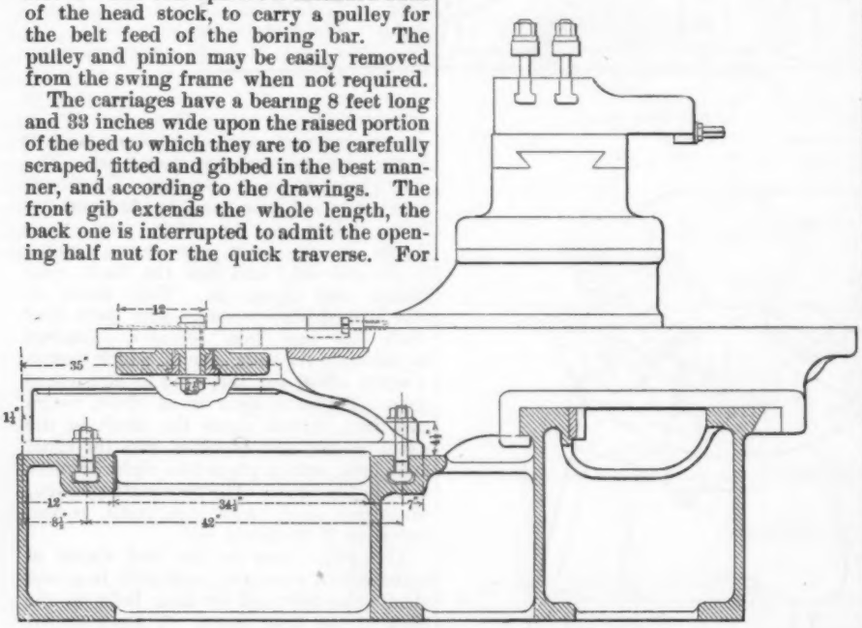
The carriages have a bearing 8 feet long and 33 inches wide upon the raised portion of the bed to which they are to be carefully scraped, fitted and gibbed in the best manner, and according to the drawings. The front gib extends the whole length, the back one is interrupted to admit the opening half nut for the quick traverse. For screw threads the lead screw actuates a double opening nut operated by a handle on top of the carriage. For the rack traverse the lead screw, by means of a keyway or spline, drives two bevel pinions of cast steel upon the same sleeve, with cast teeth, and movable longitudinally upon the screw by a reverse lever upon the top of the carriage. These pinions engage with a bevel spur placed horizontally above the screw. They are sufficiently far apart to prevent one from engaging until the other is out, and in the central position both are out. Owing to a lock strip on one-half of the nut, this latter cannot be closed, except when the bevel pinions are in the middle position and will permit the lock to enter the groove by which the reverse lever moves the pinion sleeve. The direction of the rack traverse is reversed by means of this lever: that of both traverses is reversed by the bevel clutch at the head stock end. At the front of the carriages, a forged steel pinion on the outer end of the horizontal shaft, actuates an intermediate cast steel spur journaled on a stud. This spur is provided with a friction disk which, when tightened, drives another spur upon its hub and actuates the cross feed or swivel tool slide feed, as desired, by placing the small feed pinion of forged steel either on the squared end of the cross screw, or on that of the spline shaft adjoining it, which operates the swivel rest feed by means of shafts and forged steel miters. The intermediate spur also conveys the motion to another spur on the traverse friction shaft, and here another friction disk, when tightened, locks this latter spur to a forged steel pinion on the same shaft. This pinion drives a spur on the outer end of a horizontal cross shaft, which at its inner end carries a forged steel bevel pinion meshing with a cast steel bevel spur on the hub of the rack pinion of forged steel. This bevel spur is placed horizontally and is contained in a circular box formed in the carriage. The rack pinion stands vertically and is pivoted upon a stud supported at the upper end in the cover of the circular box and at the lower end in the bearing under the carriage for the lead screw. This bearing is also counter-bored to fit the outer diameter of the rack pinion and thus take part of the thrust due to the action of the rack teeth, and is cut away to allow the pinion to mesh with the rack.

On the outer end of the traverse friction shaft is a steel disk with eight holes for a steel bar, by means of which the carriage may be traversed by hand through short distances.

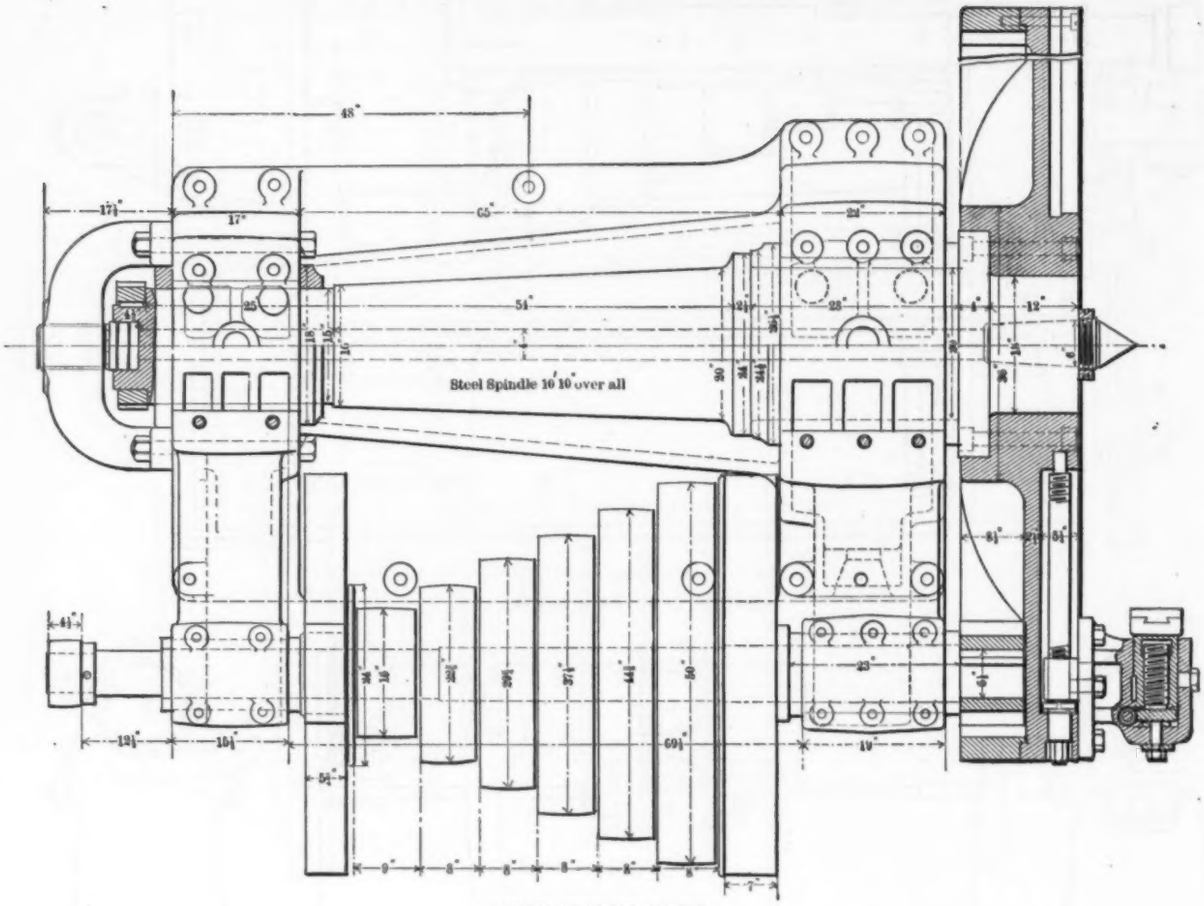
The center bar of the carriage extends forward to six inches from the center of the lathe, giving a solid support to the cross slide when run in near the center. This portion rests lightly upon the flat surface of the bed, upon which it is ad-



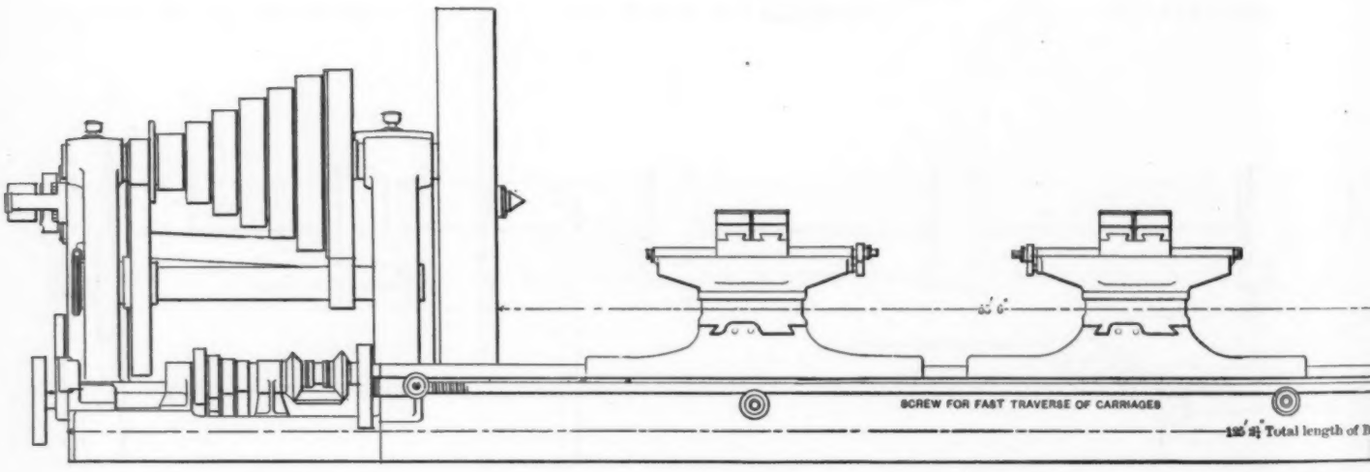
Plan of Taper Attachment.



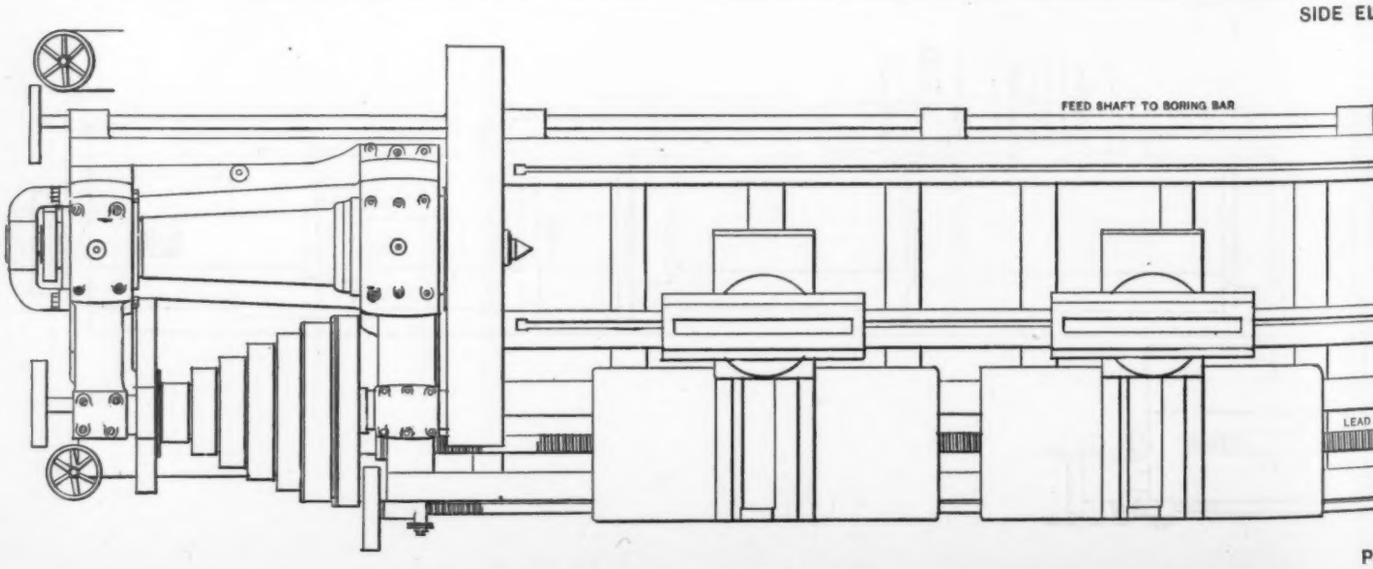
Cross Section of Taper Attachment.



HEAD STOCK—PLAN.

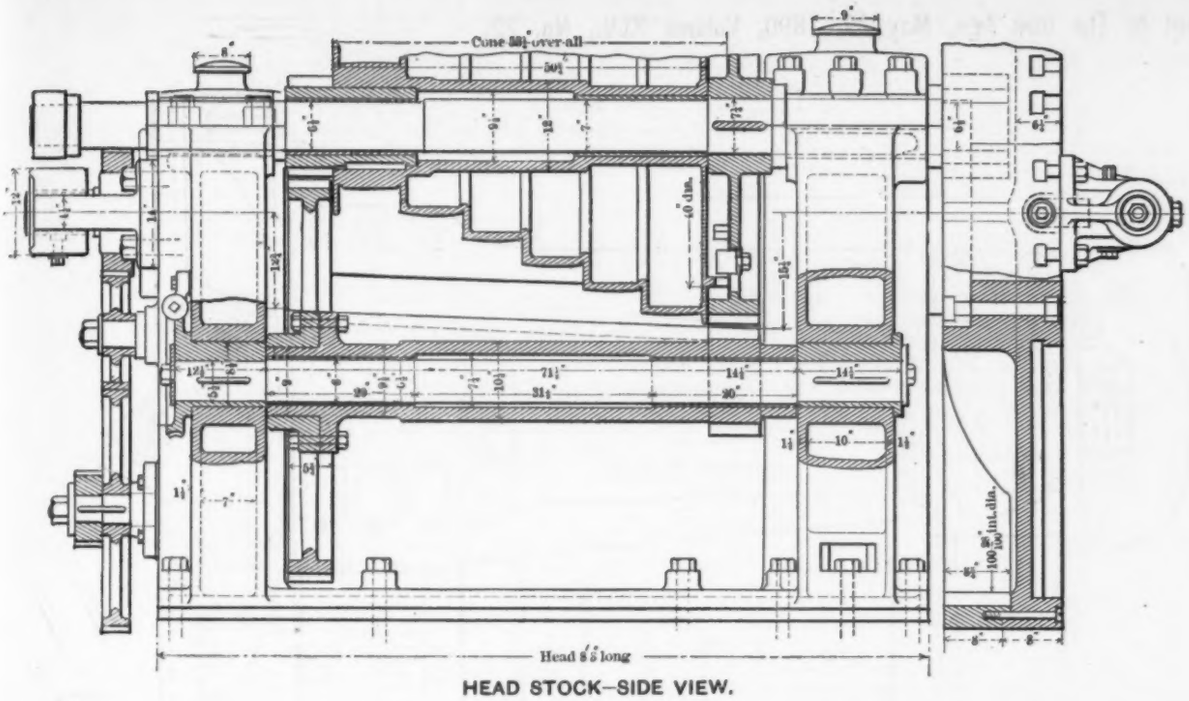


SIDE EL

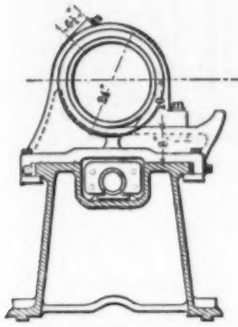


P

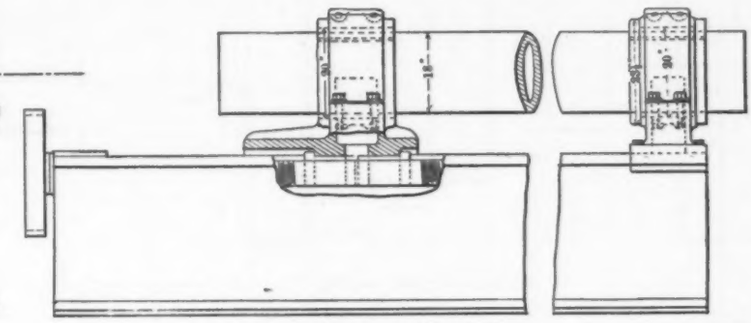
SIXTEEN-INCH GUN LATHE FOR ORDNANC



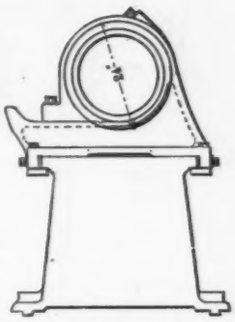
HEAD STOCK—SIDE VIEW.



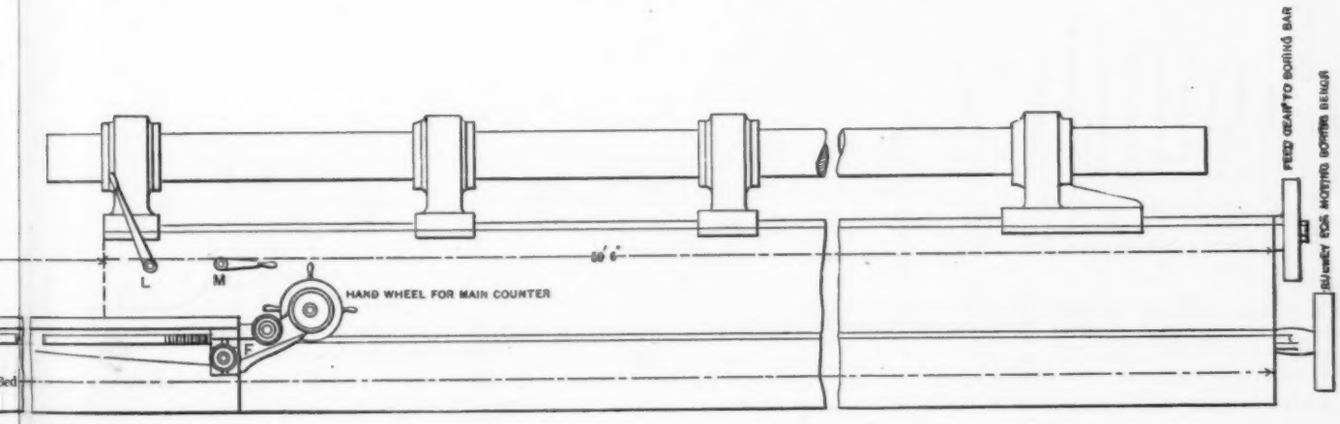
END ELEVATION.



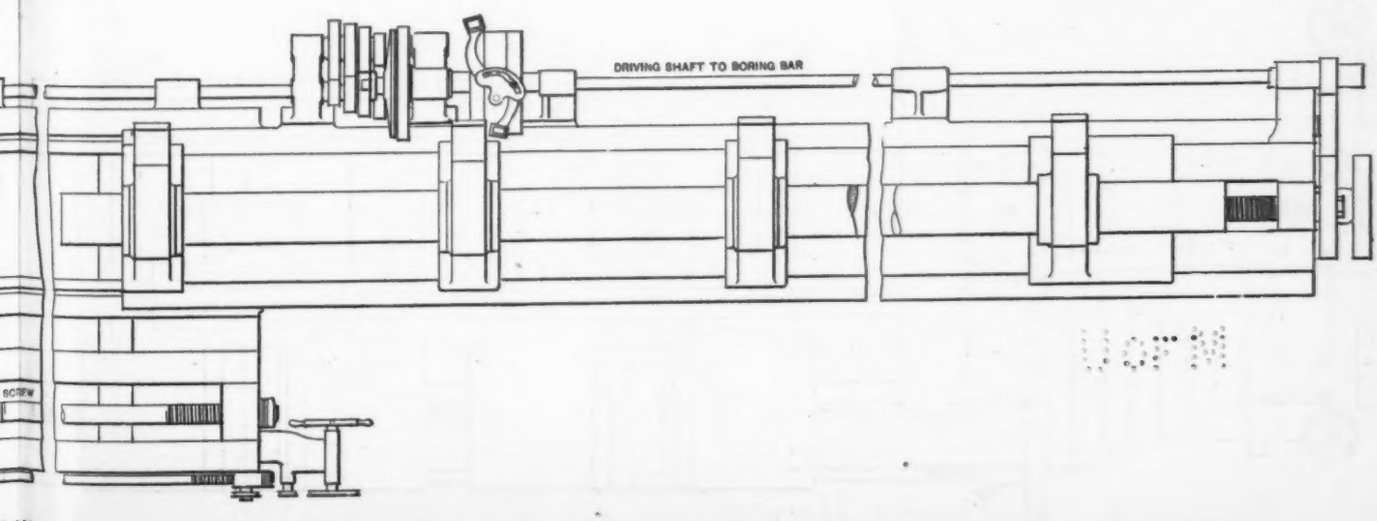
CARRIAGES FOR 18-INCH BAR.



END ELEVATION BAR SUPPORT.



LEVATION.



LAN.

CE GUN SHOPS, WASHINGTON NAVY YARD.

justed by a broad shoe held between flanges on under side of carriage, but the heaviest bearing should always be upon the raised part of the bed. A removable bearing supports the inner ends of the cross screw and spline shaft. The swivel rest carries two tool slides on one saddle. The tool clamp bolts are inserted in wrought iron straps, which fit and fill the T slots in the tool slides, but are free to slide in them, so that the tool may be clamped at any angle. The swivel rest base must be carefully indexed for 90 degrees of its circumference, from parallel with axis of lathe to right angles with it. The cross slide must face off perfectly square with the axis of lathe.

The boring bench to be made in two sections, properly fitted, keyed and bolted together, making 59 feet, 6 inches long over all. It should have a good bearing on the boring and main beds, to which it is secured by bolts well fitted in lugs at intervals along its flanges and with long heads planed to slide easily in the T slots of the beds. Two tongues planed upon the under surface of the boring bench are fitted neatly into the T slots to guide the bench while moving and keep it truly in line with the axis of the lathe. The T slots must match perfectly at the joints and be truly in line and level. The boring bench is moved by means of a screw journaled and supported in the bed and acting upon a bronze nut at the back end of the boring bench. The screw is operated by a special countershaft.

Upon the upper surface of the boring bench, the boring bar is carried in one stationary and three traversing carriages, gibbed to the flanges of the bench. The front carriage is clamped fast at the front end of the bench, the back or driving carriage is fitted with a heavy bronze nut, made in halves, and accurately adjusted to a heavy feed screw, journaled and supported in a trough-shaped recess formed in the top of the bench. This recess can be partially filled with oil for lubricating the screw. Motion is imparted to the feed screw and through it to the main carriage by suitable gearing at the back end of the boring bench, communicating with a driving shaft placed along the off side of the bench, and supported by brackets upon the bed.

The two intermediate carriages are pushed forward by the main carriage, when the bar goes forward, and withdrawn when it goes back, by means of latches arranged to throw out, when the carriages reach their proper position, against trip studs inserted in the side of the bench. The carriages are fitted with removable caps, and bushings are to be supplied to fit a bar of 14 inches diameter, and also one of 9½ inches diameter, but no bars are to be furnished. The bushings to be made each in one piece, so that, when the caps are removed, the bar may be rolled out upon the bushings on the extensions at the off side of the carriages, to allow of ready access to the bore of the gun. The bushing for the main or driving carriage is to be split on one side, to allow of clamping the bar firmly for driving.

The driving shaft along the off side of the boring bench is provided with tight and loose pulleys for revolving rapidly in opposite directions, for the quick traverse of the bar, by a special counter shaft. The cross and open belts required are controlled by a suitable shifting gear. The same driving shaft is also employed for the slow feed traverses of the bar.

The feed screw for the boring bar has 4½ inches pitch. To obtain a fine feed for the boring bar of 1-100 of an inch, 450 reductions are necessary per turn of spindle. The gearing at back end of boring bench, from the screw to the pulley or driving shaft, being three to one, leaves 150 reductions from this shaft to the main spindle. Five of these are given by the clutch gear, two by the gear cones, and five by their back gear, leaving three to be made by the gears or belt at the head stock. The gear cones will then give with back gear in, one, two, three and four hundredths feed, and with back gear out, five times this, viz. : five, ten, fifteen and twenty hundredths. Any other required feeds are obtained by the head stock change gears in the usual way.

Five counter shafts are to be furnished with the machine. The main counter shaft, having two ball and socket hangers of not less than 25 inches drop, is fitted with a cone and two tight pulleys. The intermediate counter with two similar hangers, two tight and two friction pulleys, controlled by friction clutches. These friction pulleys operate the main counter by cross and open belts. The clutches are governed by a suitable lever to which a wire rope is attached that is led down over grooved rollers and along the front of the main bed to the hand-wheel for main shifter. The line shaft, which is intended to run 200 revolutions per minute, is fitted with double friction clutch and pulleys of 45 and 35 inches diameter respectively, both of which should drive the intermediate counter in the same direction and at 188 and 146 revolutions per minute respectively. By shifting this line shaft clutch, each step of the cone gives two speeds to the spindle, without reversing its motion, while by shifting the intermediate clutch the motion of the spindle is reversed without changing its speed.

The counter for the quick traverse of the carriages is at the head stock end of the lathe adjoining the intermediate main counter. The counter for fast traverse of boring bar and for polishing is placed under the North Gallery near front end of boring bench. It is fitted with three ball and socket hangers of not less than 16 inches drop, two collars, a pair of tight and loose pulleys, a line pulley for driving the counter at 200 revolutions per minute, and one wide or two narrow tight pulleys for belting down to the pulley shaft on off side of boring bench. The pulleys and bars for polishing, as well as all boring bars, will be furnished by the department. With the lathe are furnished five steady rests, two of which have from 14 to 32 inches aperture, two from 34 to 50 inches aperture and one from 55 to 66 inches aperture.

PROVIDENCE NOTES.

There is no improvement in this vicinity in the market for iron and steel, the situation being more depressed, if anything. The greatest drawback at present is the lack of business, and on this account values are mostly on a nominal basis, as there is not enough doing to make a price. The feeling is that should some large orders for iron come on the market lower prices would be established, but with only a hand-to-mouth demand there is no object for producers to offer any concessions. The cost of raw material is also proving to be a factor in the market, and with a general higher cost all along the line, manufacturers are not disposed to accept the idea of prices for the manufactured supplies being as low as last year. Eastern millmen are prevented from cutting their prices for bar iron by the high cost and scarcity of old iron rails. They are obliged to depend largely on these rails to run their mills, and each year these rails become more scarce. As fast as a railroad company take up their old iron rails they replace them with steel, and New England has now but few of these iron rails to take up. All of the main tracks have been laid with steel rails for several years, and all that now come up from year to year are from sidings and spur tracks. Even this supply is being well reduced, and it will not be long before New England iron rails are a thing of the past. The fact that Eastern millmen have depended on these old rails for supplies has given the roads a great advantage, as they take them up only as they can find a sale. In many cases the old rails have brought almost enough to pay the cost of purchasing new steel rails, so the roads have been able to make the change from iron to steel at a very small cost to themselves. The pig iron situation is still quiet, but values hold on a steady basis. Bar iron is dull, and it is only in a very small way that supplies are being taken. Structural iron continues, with values ruling about steady, although large buyers could undoubtedly get concessions on most kinds. Nails are moving well and hold firm. Boiler tubes are also active, while a fair movement is noted in general lines of water piping and supplies.

For some time the Hotchkiss Gun and Torpedo Company, of this city, have been making a torpedo gun and torpedoes for the United States Government. It was finished a few days ago, and has been received on board the United States torpedo boat Stiletto. The gun sends a torpedo capable of carrying 100 pounds of gun cotton. The topedo is of the auto-mobile pattern, which not only possesses the driving power, but also steering power after it leaves the gun. The Stiletto has sailed for the torpedo station at Newport, where trials will be given the torpedo and gun—the trials to last some two or three weeks.

The Pawtucket Mfg. Company are about to build another large building. It will be one story high, 128 feet long and 91 feet wide.

The Fall River Iron Works mill is driven by a six-cylinder triple-expansion Corliss engine, or perhaps it may be better described as two complete tandem triple expansion engines attached to opposite ends of the same shaft. It is rated at 1300 horse-power when running at the rate of 65 revolutions per minute and with 150 pounds initial pressure. The high pressure cylinders are 16½ inches in diameter, the intermediate 28 inches and the low pressure 42 inches, the stroke being 5 feet. The fly wheel is 28 feet in diameter, 114 inches on the face and carries four belts, two of which are 32 inches in width, one 26 inches and one 16 inches. The pulley weighed, when finished, 97,728 pounds. The cylinders are steam jacketed and cased in sheet metal instead of the usual black walnut lagging. The wrist-plate is superseded by the more modern arrangement now used universally by the Corliss Company, securing a more rapid movement to the valve. Each cylinder is provided with the Corliss Company's new release valve, allowing for the escape of entrained water. This consists of a long, flat steel spring, the ends of which press upon valves located in the back bonnets of the exhausts ports. An excessive pressure such as would be generated by the confinement of water in the cylinder, lifts these valves against the action of the springs and allows the water to escape. The engines have been in operation for several weeks and develop 1400 horse-power.

James H. Lee has recently purchased the business of the Providence Brass Foundry, and will continue to do business at 460 Eddy street, Providence, under the name of the Providence Brass Foundry and Machine Company. LEONIDAS.

Another shipbuilding firm on the Pacific Coast is in the field as a possible competitor for naval contracts. The Corando Foundry and Machine Company, of Corando, Cal., have applied for plans and specifications of the Naval Academy practice vessel, for which bids will be opened June 10.

THE WEEK.

Philadelphia now has a rapid transit commission, composed of the presidents of both branches of Councils, the chairman of the important committees, President Roberts, of the Pennsylvania Railroad; President Corbin, of the Reading Railroad; a representative of the Baltimore and Ohio Railroad; President Wm. H. Kemble, of the Philadelphia Traction Company; President Murphy, of the Peoples' Line; Messrs. John Lucas, John Sellers, Jr., Thomas U. King, Hamilton Disston, and Wm. F. McCully. The mayor promises to give these gentlemen something to do.

Capt. Guy C. Goss, of Bath, Maine, who died a few days ago, was chiefly instrumental in establishing the Goss Iron Works, now in the hands of Gen. Hyde. He also established the Marine Railway.

All the street railroads in Buffalo have been sold to a syndicate consisting of M. A. Verner, of Pittsburgh; H. Sellers McKee, of Pittsburgh; Patton & Co., of New York, and T. Dewitt Cuyler, for $1,000,000.

The main front of the Union Railway station soon to be put under contract at Duluth will be 420 feet in length and three stories high, of glazed brick, with a central tower. The train shed will be built of glass and iron.

England is glutted with beef as never before, and American exporters are suffering. Shipments cannot be made from New York excepting at a loss.

The annual report of the Canadian Pacific Railway Company attaches great importance to their connection with the Wabash Railway at Detroit. By a new extension now almost finished Quebec is included in the system.

Two linseed oil mills are being erected in Chicago. The largest is for the Wright & Hill's Company, of which Henry H. Getty is president, and will have 24 presses, with a capacity of 1,000,000 bushels per annum. Excepting the Campbell-Thayer mill it will be the largest in America.

K. Nakamura, of Japan, is in this country to purchase a plant for Tokio's new street railway.

Several Fall River cotton manufacturers are becoming interested in mills in the Southwest.

A gentleman residing in the Northwest, who has for years past watched closely the westher of that region, says there are not far from a thousand lake sites marked on the official maps in Minnesota and the two Dakotas which are not now in existence.

The new tank steamship Beacon Lights ran into an iceberg on the Grand Banks and several of her plates were crushed, but the buoyancy of the tanks that escaped injury kept her from sinking. The Thingvalla had a similar experience, losing her entire stem, and the Gascogne got on the rocks at Scilly Islands and crushed several plates.

Capt. Zalinski, after making a tour on the Continent, remarks that everywhere preparations for war are active, and that trouble is more likely to originate between Germany and Russia than anywhere else.

Stanley says that every pound of ivory obtained in Africa costs a human life. Formerly the ivory most highly prized was found in a negro's jaw, but life was spared in most instances.

Several leading men in this State, including Chauncey M. Depew, ex-Senators Miller and Platt, Secretary Tracy, ex-Secretary Whitney. John Claflin, Dr. A. B. Loomis, Jesse Seligman, J. Pierpont Morgan, Whitelaw Reid and Vice-President Morton have become members of an Adirondack Park Association, formed last week to secure the preservation of the forests.

The Senate Committee last week took a decided stand against any further construction of vessels in the navy yards by refusing all appropriations for increasing ship and machinery building plants. The Boston yard suffers by this to the extent of $50,000, and the provision for the rebuilding of the burned shops at Kittery, Me., yard was also stricken out. Boston is now talking about a day of reckoning for Senator Hale.

One of the bullish schemes that are in embryo, with a chance of being brought forth at the first propitious moment, is the project for the consolidation of the production of anthracite coal in a manner that shall give each of the great producers his fair proportion of tonnage, yet save 71 cents per ton on production expenses by operating only such collieries as happen to be necessary to supply the current demand. The supposition that the plan was near to a fruition has already assisted in raising the price of Deleware and Hudson, Lackawanna and Lehigh Valley. So far as yet appears those parties who most naturally would be chiefly interested know the least about it.

The report of the New York Bureau of Labor Statistics shows that during the last five years the amount of wages lost by employees in that State on account of strikes amounted to $8,042,915, while employers lost from the same cause $5,157,942. These figures furnish good evidence of the value of arbitration in the settlement of labor disputes.

The Canadians are about to have an independent cable connection via Canso, from which they expect substantial advantages.

Philadelphia butchers have tested artificial ice for a year, and state that there is absolutely no difference between that and the finest Kennebec.

The Atchinson-Frisco "deal," according to Boston authority, is only another step in the growing tendency to a consolidation of large railroad interests all over the country, created chiefly by the passage of the Interstate law. The consolidation "fever," if it can properly be called that, is ultimately going to bring the whole of the immense railroad system of this country under the control of a comparatively few corporations. It is going to eliminate small lines, benefit the public in giving increased facilities, and, best of all, is going to simplify the rate problem, which has so long been a disturbing and injurious factor in the railroad situation.

It is reported that foreign steamers are now taking more coal in New York than at any time for years.

One of the bills signed by Governor Hill provides for the appointment of eight women factory inspectors.

The Reading Railroad Company contemplate an important connection with the Erie Railway near Corning, thus securing a short route to Buffalo for the distribution of coal, and will also connect with the Canadian Pacific via Watertown and Ogdensburg.

Another bridge, across Niagara River, north of the Cantilever and Suspension bridges, is provided for by a law which has received the signature of the Governor. The capital stock is $500,000, but may be increased to $2,000,000. The charter of the Canadian end of the bridge, it is understood, is held in the interest of the Canadian Pacific, and now that a charter has been obtained on this side a consolidation of interests most likely will be effected. As soon as this is done, the Canadian Pacific will build to Niagara River, and secure an entrance into Buffalo.

New Orleans papers are gratified to note that planting has commenced in the recently flooded districts of Arkansas and that full crops are promised. In the cotton counties of Mississippi and Louisiana the water will soon be fully out. It is difficult to predict with certainty as yet as to the lower portion of Louisiana.

Filibusters are engaged in a chimerical scheme to seize Lower California, with the object of promoting annexation to the United States. An English land and colonization company appear to be chiefly concerned, but are likely to be hoisted by their own petard.

Building expenses in Philadelphia this year have been increased by higher wages to all classes of mechanics.

The Springfield *Republican* calls the vote of the House excluding Mexican lead ores another "blow at Massachusetts," whose citizens have invested millions of dollars in railways with the object of developing Mexican trade. Another and the greater grievance is the application of certain features of the Interstate Commerce law, whereby Massachusetts is embarrassed in her intercourse with Canada over the Canadian Pacific Railroad.

A member of the Newark File and Rasp Makers' Union, who attended the convention of the Journeymen Horseshoers in Cleveland last week, induced that body to adopt the stamp of that organization. This means that hereafter the horseshoers will use only the files and rasps which bear the union stamp.

A strike against the further introduction of brick machines is said to be threatened in Philadelphia, where there are now at least 40 of them in use, reducing the cost of bricks and at the same time superseding manual labor to some extent. Wages, however, have been increased. A manufacturer says: "One machine can make 30,000 bricks a day. It requires seven men and two boys to run it. To make 30,000 bricks by hand requires 26 men and 13 boys. However, men can make better bricks than machines, and the style of hand made bricks that would cost the consumer $9.50, if made by machines only command $6.50. There is no machine in existence which can manufacture a first-class pressed brick, but I believe such a one will be invented, and in four years all bricks will be made with machines." There are in Philadelphia about 60 brick yards, and they employ on an average 60 men, or 3600 in the aggregate.

The first submarine cable across the Gulf Stream will be laid between Halifax and the Bermudas by June 24.

The general meeting of the American Institute of Electrical Engineers was held at the Institute of Technology building in Boston last week. The day was devoted to the discussion of electrical matters. At the morning meeting Prof. Elihu Thomson presided, in the absence of Prof. W. A. Anthony, of Manchester, Conn., the newly elected president of the institute. Gen. Francis A. Walker, president of the Institute of Technology, made an address of welcome. Addresses and a banquet followed.

The Atchison, Topeka and Santa Fé by acquiring the St. Louis and San Francisco removes a possible rival, running just south of it, ends the joint ownership and several guarantee of the Atlantic and Pacific and gains an entrance to St. Louis. The Atchison will reach the Eastern Trunk lines at St. Louis as well as at Chi-

cago, and, as their purchased road has had their closest relations with the Pennsylvania, the new ownership is likely to turn to St. Louis and thence east over Pennsylvania lines an increasing share of the growing corn freightage of the Atchison. In the broad territory which the Atchison now covers to the West from Kansas, it will have one less rival, and over a wide expanse none. At the face capitalization of the St. Louis and San Francisco, the Atchison's issue of stock and bonds adds $58,000,000 to the capitalization of the latter, or an addition of about ⅛ to the $302,000,000 now outstanding.

Boodlers are not indigenous to the United States. A Montreal telegram says: "It now transpires that John P. Whelan, the contractor for the Quebec Court House, has paid over $100,000 to the Mercier Government in the last four or five years to secure contracts for government work, at least $40,000 of which, Mr. Whelan says, was blackmailed out of him."

The keen competition of Russian oil with the Standard Company in foreign markets is seen by the returns of export trade. During the ten months ended April 30 the exports of petroleum from the United States amounted to 542,277,621 gallons, of the value of $42,047,325. In the same months of the previous year the exports of petroleum amounted to 504,353,090 gallons, valued at $41,170,428. In order to increase the exportation in competition with Russian oil it was necessary to reduce the price. The exports of illuminating oil during the last ten months amounted to 426,616,813 gallons, valued at $31,328,892. But in the same ten months of the previous year the exports of illuminating oil, amounting to 407,878,689 gallons, had a value of $32,259,609.

The trades school connected with the Elmira Reformatory, at Elmira, N. Y., now has about 750 young men in course of training, under the direction of superintendent Z. R. Brockway It is said that those who learn a trade in the Reformatory generally fill outside positions satisfactorily, ranking among workingmen as advanced apprentices. The following are among the classes in operation under competent instruction: Machinists, blacksmithing, stone cutting, carpentry, pattern making, wood turning, frescoing, bricklaying, plastering, plumbing, brass furnishing, tinsmithing, brass molding, iron molding, boat building.

Telegrams from Ottawa state that the government has concluded an arrangement by which the Hudson Bay Railway Company will receive sufficient aid this year to enable them to build a track to Saskatchewan, a distance of 225 miles, as installment on the general scheme. Until lately the proposed railway was supposed to be visionary, on account of natural difficulties in that hyperbarren region, not to speak of the condition of the Government treasury.

It is said that the Rothchilds, the owners of the Russian oil wells, will, in a short time, award to an American firm the contract for the building of a pipe line 497 miles long, to run from the oil wells at Baku, on the Caspian, to Batoum, on the Black Sea, the loading port. The pipes will be of cast iron, 8 inches in diameter, and there will be 64 intermediate stations. It is surmised that the success of the proposed line will prove prejudicial to the exporting interests of American producers.

The Duluth Iron and Steel Company, whose $200,000 furnace will soon go into operation, have decided to build 100 coke ovens and to make extensive dock improvements.

MANUFACTURING.

Iron and Steel.

On the afternoon of the 22d inst. arrangements were completed by which the Youngstown Steel Company, of Youngstown, Ohio, purchased the Tod Furnace, owned by the Brier Hill Iron and Coal Company, of that place, the consideration being private. The purchasers are the owners of the washed metal plant and intend to adopt the direct process of purifying the metal as drawn from the furnace, without remelting it in the cupola, as has been the custom. The Brier Hill Coal and Iron Company are having plans prepared for the erection of a large blast furnace as a companion to their present Grace Furnace, which is one of the largest in the Mahoning Valley.

The financial troubles surrounding the building of the new rolling mill in Lancaster, Ohio, in which Youngstown and Pittsburgh capitalists are largely interested, reached the courts at Youngstown, Ohio, on Tuesday, the 20th inst. Henry M. Garlick, on behalf of himself and other creditors, representing claims amounting to $17,566.66, commenced suit against the Lancaster Iron Company, of Lancaster, Ohio. Lloyd Booth, president of the company, at once filed an answer, admitting the allegations of the petition as to the indebtedness, and a judgment for the amount claimed was entered by Judge Gilmer. An execution was at once issued and placed in the hands of Ralph J. Wick, who will have the entire property levied upon. The stockholders at Youngstown and in Pittsburgh claim that the parties in Lancaster have not paid in the money they agreed to when it was decided to locate the mill in that city.

The Everett Furnace, Joseph E. Thorpp, owner, located in Bedford County, Pa., last week produced 730 tons iron, 90 per cent. foundry. This is nearly double the average make under the management of the former owners, and considering the mixture of ores only averaged about 45 per cent., may be considered good work.

Carnegie Brothers & Co., Limited, of Pittsburgh, are at present operating seven of their completed furnaces at Braddock, Pa. Five of them are running on Bessemer and the other two on spiegel. Furnace C is out of blast, undergoing repairs; furnace I, now in course of erection, will be completed and put in operation some time during the coming month.

In one of the Pittsburgh papers recently appeared a statement that Carnegie, Phipps & Co., Limited, of Pittsburgh, were about to commence the erection of another universal plate mill at Homestead. We are advised that there is no truth in the report whatever.

The new plant of the Greensburg Steel Company, located at Huff Station, about 33 miles from Pittsburgh, is now in operation with excellent prospects for the future. The plant contains a single and a double heating furnace, one welding furnace and a 24-pot crucible furnace. They also have a 600-pound and a 1200-pound hammer, built by S. Trethewey & Co., Limited, of Pittsburgh. The firm manufacture tool steel exclusively, and when in full operation the plant will turn out about 3 tons per day. A large number of samples of the steel were sent to firms in different parts of the country, from which some excellent reports have been received. The steel is put on the market under three brands, as follows: Coronet Special, Coronet Extra Special and Isaac's Special Coronet Steel. The following are the officers of the company: John Kuhns, president; James C. Clarke, treasurer; J. Clark Williams, secretary, and A. C. Isaacs, general manager.

The blast furnace of the Riverside Iron Works, at Wheeling, W. Va., will be blown out in a few days for relining and repairs.

W. J. Hammond & Son, iron manufacturers, of Pittsburgh, have purchased 18 acres of ground in Mansfield, near that city, on which they propose to erect a plant for the manufacture of iron and steel. The old plant of the firm was located in Second avenue, Pittsburgh, but was burned down some time ago.

The strike of the employees of the National Tube Works Company, of McKeesport, Pa., mention of which was made in our issue of last week, has been settled. On Thursday, the 22d inst., E. C. Converse presented the following proposition to the men, which they accepted: 1. You promptly rectify the wrong you did this company in striking because we refused a demand which you have since admitted it was impossible for us to grant, by returning to work forthwith without prejudice to individuals. 2. A committee of five persons to be appointed, such committee to consist of employees, two of whom shall be chosen by you, two by us, and the fifth by the four so chosen. The qualifications of a committeeman to be a record of not less than three years' service in good standing. 3. The committee to take such time as they may find necessary, according to their own judgment, to thoroughly investigate the wages paid to those mills against which we have to compete in the disposal of our pipes and tubes. 4. We, on our part, to rectify any inequality or difference between the wages paid by us and those paid by our competitors when shown; and further agreeing that we will not lower the wages of the workmen, to whom we are now paying wages higher than at other mills. 5. You, on your part, to agree to cheerfully accept the present wages, or such as may be changed under the conditions named in article fourth, upon the return and report of the committee. 6. Any readjustment made in accordance with article fourth to take effect from the date work is resumed. 7. We to pay all expenses of the committee, including wages. It is estimated that the workmen lost between $90,000 and $100,000 in wages during the continuance of the strike.

A recent issue of the *Bulletin* says: At a recent meeting of the directors of the Duluth Iron and Steel Company, of Duluth, Minn., the blast furnace was shown to be about complete, at a total cost, in round figures, of $200,000, and so arranged that it could be started up in full blast in two or three weeks. It was shown that the furnace was entirely paid for, that the company had land to extend its plant and to increase its facilities, and also a small surplus of funds. It was also shown that vessels cannot now get to the furnace docks, and will not be able to do so until certain dredging is done about the piers of the St. Paul and Duluth Bridge. This dredging the Government has ordered the railway company to carry out at once. It is expected that in two months this dredging will be completed. The directors discussed the project of building 100 coke ovens, and practically decided to put them in. The ovens will be of brick, each from 10 to 12 feet square, and will cost $25,000 to $30,000. It is expected that all these impeovements, as well as the necessary addition to the dock to fit it for the handling of coal and limestone, will be completed in about 90 days, so that the furnace can then start up.

Mary furnace, of the Ohio Iron and Steel Company, Lowellville, Ohio, the lining of which fell in recently, is undergoing repairs and will be in operation again June 15.

One of the stacks of the Andover Iron Company, Phillipsburg, N. J., has gone out of blast.

The Midway Iron Company, capital stock $300,000, have been incorporated at Roanoke, Va. Land has been donated by the Midway Land Company, near Roanoke, on which the company will erect a plant for the manufacture of spikes and nails.

The regular annual meeting of the stockholders of the Woodstock Iron Company, Anniston, Ala., was held on the 20th inst. The directors were authorized to issue 20 year 6 per cent. bonds to the amount of $1,000,000, and to execute a mortgage on the company's property as security for the same. The following directors were elected: A. L. Tyler, S. E. Noble, T. G. Bush, T. F. Howell, T. H. Aldrich, Jno. W. Noble and W. H. Ledbetter.

The Troy Steel and Iron Company, at Troy, N. Y., blew in their No. 2 furnace on the 20th inst., so that now the entire blast furnace plant, including three stacks, is in operation. Nos. 1 and 3 were started in last November, and have done excellent work, the best record having been made on April 28, when the two furnaces produced 440 tons per day. Charles McCrery is superintendent of the plant.

The annual meeting of the directors of the Pennsylvania Steel Company will be held at Sparrow's Point, Md., on Decoration Day. Major Bent, of the Steelton plant, will have charge of the party who will inspect the new works.

The Cleveland (Ohio) Rolling Mill Company have purchased from Edward Ryan, of Houghton, Mich., the Ryan or Trimble iron mine on the Gogebic Range, one and one-half miles from Hurley. The price paid was $125,000.

The new steel plant of the W. Dewees Wood Company, of McKeesport, Pa., was tested on the 19th inst., J. McGraff, of Janesville, being in charge of the test. The result was highly satisfactory, and the plant will remain in operation from now on.

The Board of Trade and Real Estate Exchange, of Cheyenne, Wy. T., will shortly offer a bonus for the establishment of a smelter at that place.

The Brier Hill Iron and Coal Company, of Youngstown, Ohio, contemplate the erection of a blast furnace as a companion to their pres-

ent Grace furnace. The Tod furnace, formerly owned by this company, has been sold to the Youngstown Steel Company.

The cast of a 4-inch steel cannon has been successfully made at the Carpenter Steel Works, Reading, Pa.

W. J. Hammond, of Pittsburgh, has secured 18 acres of land at Mansfield, Pa., and will build a steel mill at once with probably a tin plate mill addition later on.

The strike at the Glendon Iron Works Easton, Pa., is still on, with no immediate prospect of settlement.

Machinery.

The Leechburg Foundry and Machine Company, of Pittsburgh, have received a contract for the cast iron work for the new blast furnace to be erected by the Thomas Furnace Company, at Niles, Ohio. The furnace will be 75 x 17 feet, and will be ready for blast about September 1 next.

The Union Foundry and Machine Company, of Catasauqua, Pa., have done away with their cupola hoist and substituted a Morse noiseless elevator, in consequence of which changes the foundry was idle for several days last week. The firm are turning out large quantities of architectural castings, and are shipping large consignments to New York City and vicinity.

The Westinghouse Air Brake Company, of Pittsburgh, is about to conclude an agreement with the Queen and Crescent system of railroads for the furnishing of air brakes to all the new freight cars turned out by that system at its different shops. The Cincinnati, New Orleans and Texas Pacific Railway Company, the Alabama Great Southern, the New Orleans and Northeastern, the Alabama and Vicksburg, and the Vicksburg, Shreveport and Pacific railroads all belong to this system, and the order is a large one. In addition to that, the company also received an order from the New York Central Railroad Company for the furnishment of 1000 sets of air brakes for freight cars. On account of unforeseen delays the entire plant of the Westinghouse Air Brake Company will not be removed from Allegheny to Wilmerding before three months at least. In the meantime, both works will be operated in order to fill the large orders which this firm have on their books When the Allegheny buildings are entirely vacated by the above named concern, the Fuel Gas and Electric Engineering Company, Limited, another Westinghouse concern will take possession. This corporation intends to refit these shops with the necessary machinery for making the apparatus sold by this company.

The American Wheel Company, of Chicago, a corporation composed of ten of the largest wheel factories in the country, have purchased the property of the Lansing Wheel Company, of Lansing, Mich. The new owners are said to have a capital of $2,000,000, and the Lansing works will be operated to their full capacity.

H. S. Hudson, of Brooklyn, N. Y., W. H. Eberle, of Philadelphia, and F. A. Buren, of Merchantville, Pa., are the incorporators of the Brady Vapor Engine Company, for which articles of incorporation have been filed at Camden, N. J. The capital stock is announced as $3,000,000, and the objects of the concern are to manufacture and sell vapor engines.

The Miner & Peck Mfg. Company, W. W. Miner, G. W. Peck and S. Peck, proprietors, succeed Beecher & Peck, New Haven, Conn., and will continue the manufacture of The Peck Patent Drop Press, Drop Forgings and Blast Forges. With increased capital and facilities the new concern will be in a position to more promptly meet the demands of their growing business.

Bridgeport Machine Tool Works, E. P. Bullard, proprietor, have recently added about 7000 square feet of floor space to their factory in Bridgeport, Conn., and fitted up handsome offices. New machinery also has been put in and the capacity of the shop increased generally.

Jerome B. Secor, manufacturer of special machinery, has removed from Railroad avenue, Bridgeport, to a new shop on Washington avenue, same city, where he occupies three floors of a conveniently planned building.

Mason Regulator Company, Boston, Mass., advise us that they have recently received quite a large order for their reducing valves from the Pennsylvania Railroad Company.

Hardware.

Hussey, Binns & Co., Limited, of Pittsburgh, manufacturers of shovels, spades and scoops, have decided to remove their entire plant to Charleroi, on the Pittsburgh, Virginia and Charleston Railroad, about 40 miles from Pittsburgh. The buildings will cover 1½ acres of ground, 1 acre being under roof. There are to be three departments, a crucible steel casting and melting department, sheet steel department and finishing department. The buildings will be of brick, on solid foundations, with extra heavy iron roofs. They will be large enough to enable the firm to treble their present capacity. The warehouse will be 80 x 300 feet, shovel department 90 x 275 feet, and steel plant 90 x 225 feet. New and improved machinery will be introduced and the new plant will be one of the most complete of its kind in the country The firm found it necessary to remove their plant on account of the rapid growth of their business, their present quarters being too small to meet their needs. They are much pleased with the new location, as they will have ample shipping facilities, and a very strong gas well is located close to their property. Riter & Conley, of Pittsburgh, have the contract for the erection of the buildings, and expect to have them ready for occupancy not later than October 1 next.

L. S. Starrett, Athol, Mass, is putting a number of new and improved tools into the recent addition to his factory, so that he will soon be in shape to fill all orders promptly. For some months past he has been unable to do this on account of the increased demand for his tools, which has outgrown his manufacturing facilities.

E. P. Breckenridge & Co., manufacturers of grocers' fixtures and druggists' tinware, Toledo, Ohio, since the destruction of their factory by fire, have energetically devoted themselves to the completion of a new building, which is now ready for occupancy. This building, we are advised, is much larger than their former one, and their manufacturing facilities are thus materially increased.

The American Bolt and Screw Case Company, Dayton, Ohio, have removed to a new factory, where they have increased facilities for the manufacture of their revolving bolt and screw cases.

The Belcher & Taylor Agricultural Tool Company, Chicopee Falls, Mass., who in December last bought of the assignees of B. & J. W. Belcher the stock, patterns, patents, goodwill, &c., of that firm, recently purchased the business of John R. Whittemore, and his line of feed cutters, vegetable cutters, plows, &c., have been added to the other goods which they have heretofore manufactured. The company were organized in November, 1864, and their present treasurer, Geo. S. Taylor, has acted in that capacity since their inception.

Miscellaneous.

The Palmer (Mass.) Wire Mfg. Company held their annual meeting on the 21st inst. and elected the following officers: President, John S. Holden; vice-president, Wm. C. Dewey; treasurer, Henry P. Holden; clerk, W. W. Leach; directors, J. S. Holden, W. C. Dewey, W. W. Leach

Hinkle Furnace, of the Ashland Iron and Steel Company, Ashland, Wis., recently produced 884 gross tons of iron in one week, using charcoal exclusively for fuel and running on Gogebic ores.

The Iowa Barb Wire Company, whose works are at Allentown, Pa., deny that they propose to build a wire nail plant.

The Milwaukee, (Wis)., Bridge and Iron Company will built a new plant on property purchased about a year ago, near the Minerva furnace, in that city. The main building will be 600 x 100, and the entire works, exclusive of machinery, will cost $175,000. When in full operation, nearly 500 men will be employed.

The Brooke Locomotive Works, Dunkirk, N. Y., have received an order for three locomotives for the railroad from Jaffa to Jerusalem. These will be the first locomotives in the Holy Land.

The new building for the Daniel E. Paris Stove Company, at Sioux City, Iowa, will be built of iron by the Berlin Iron Bridge Company, of East Berlin, Conn. The foundry building will be 155 feet wide by 350 feet long, the mounting room 87 feet wide by 225 feet long, and the boiler engine and plating room 50 feet wide by 196 feet long. The Berlin Iron Bridge Company also have the contract for the new foundry building of the Waterbury Farrel Foundry and Machine Company, at Waterbury, Conn.

At the Phœnix Works, at Ruhrort, Germany, experiments have been made, for some time past, in the use of carbon as a recarbonizer in the place of ferromanganese or spiegeleisen. Similar experiments have been conducted at the Brymbo Basic Steel Works, Wales.

PERSONAL.

William Crockard, who for the past 16 years has been superintendent of the blast furnace plant of the Riverside Iron Works, at Wheeling, W. Va., has resigned his position.

Prof. Thomas Egleston, of the School of Mines, Columbia College, has sailed for Europe.

William G. Neilson recently severed his connection with the Standard Steel Works, of Logan, Mifflin County, Pa., after being their manager for over 13 years. On May 2 he was elected vice-president of the Chester Rolling Mills, of Thurlow, Chester County, Pa. Mr. Neilson still retains a private office in the office of the Standard Steel Works, at No. 220 South Fourth street, Philadelphia.

Charles Hyde, formerly of Lewis & Hyde, general brokers in iron and steel, at Pittsburgh, has retired from that firm and has embarked in the business of engineer and contractor. Mr. Hyde will contract for the erection of steel plants, open-hearth basic plants, blast furnaces, &c. His office is in Room 902, Lewis Building, Pittsburgh.

William Bispham, of W. N. Wallace & Co., iron merchants, of New York, has gone abroad.

Andrew Carnegie sailed for Europe last week. He will be at Cluny Castle, Kengassee, Scotland, until in September.

W. L. Abbott, chairman of Carnegie, Phipps & Co , Limited, of Pittsburgh, returned home last week from a two months' trip to Europe.

M. D. W. Loomis, for some years treasurer of the Linden Steel Company, Limited, at Pittsburgh, has resigned, and his interest has been purchased by the company. Mr. Loomis has accepted a similar position with the Detroit Steel and Spring Works, of Detroit, Mich. The officers of the Linden Steel Company, Limited, are now as follows: W. J. Lewis, president; Henry Lloyd, vice-president; Cephas Taylor, secretary and treasurer. W. J. Lewis, Jr., has been admitted as one of the managers of the firm.

James P. Witherow, the well-known engineer and contractor, of Pittsburgh, sailed for Europe on Wednesday, the 21st inst. He will be absent about two months.

J. W. Maxwell, recently engineer and superintendent of The Whitely Steel Company, has formed a partnership with G. H. Vincett, of Syracuse, N. Y., under the firm name of Springfield Steel Casting Company, and will engage in the manufacture of steel castings in Springfield, Ohio. The plant will be in operation in two weeks.

W. P Norton, manufacturer of Norton's Upright Drills, has removed from Bristol, Conn., to Plainville, Conn., and associated with him in business is W. S. Jones under firm name of the Norton & Jones Machine Tool Works. Mr. Jones was for a number of years a contractor for the Hendy Machine Company, Torrington, Conn., and has had over 25 years' experience in the machine tool business. The new company have purchased several acres of ground at Plainville on the line of the N. Y., N. H. & H., and N. Y. & N. E. Railroads, and are erecting a commodious shop connected by side tracks with both railroads, which will be equipped in the best manner for the building of standard machine tools and special machinery.

It is understood that a contract has been made at Richlands for the construction of a $500,000 pipe works.

The Iron Age

New York, Thursday, May 29, 1890.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR. - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

A New Departure in Banking.

Private information shows that the Universal Association Bank and Trust Company, with a capital of $100,000,000, is on an assured footing. Its railway guarantee department is an entirely new departure in finance, and promises to make many changes in existing methods. The idea is to guarantee railway bonds, not only to the full amount of their interest, but also to the extent of any deficiency in the earnings of the road. It is proposed to divide profits with such roads as this company guarantees when the bonds are first offered for sale. When a new road proposes to build, extend and equip its plant, and applies to this company for a guarantee of the interest upon its first mortgage bonds, the company carefully investigates the responsibility of the projectors and requires them to pay out so much money as may put the new undertaking upon a solid basis; next examines, by means of expert engineers and others, all the prospects of the road, and if in the opinion of these investigating officers the risk is considered great, the guarantee is declined; if, on the other hand, the road's future prospects are good the company takes the risk and announces the fact to the public. A contract is then drawn up with the new railway company agreeing to divide equally, or if the road's prospects of success are unusually good, to receive from 10 to 15 per cent. of the selling price of the new bonds; the division being the difference between what the bonds will be sold for under such guarantee and the sum they would bring without it.

It is estimated that a road's bonds, with fair prospects, are ordinarily worth 60 per cent. at the common rate of interest to-day offered; and it is further estimated that the same bonds with this company's guarantee will be worth fully par; this difference of 40 per cent. will be divided, in the above manner, between the company and the railway. After their sale on the exchange the company continues the guarantee annually, charging for such services in accordance with each risk; if it be considered safe, a fraction of 1 per cent., and higher if the road gets into trouble, but the contract varies in each case. Ordinarily the guarantee will continue during the term the bonds run regardless of what happens to the road. Whatever the form of the guarantee in particulars of this kind the bondholders will be fully informed concerning it, and naturally the permanency of such guarantee throughout all contingencies will have much to do with the original exchange price offered. The company will accept or guarantee first mortgages only, mortgages that cover all of the railroad's possessions, whatever their nature, and they will be somewhat in the position of a receiver should the road fail to meet its bonded obligations, although in many such instances, if they occur, the company would allow the old management to maintain control so long as it acts in behalf of the bondholders. At the same time the road would have the company's active supervision. It may be readily surmised that the fear in the minds of bondholders that an insolvent road cannot be safely left in the hands of the old management will be greatly reduced. They will look to the guarantee company for the interest upon their bonds, will feel assured that the company will sufficiently look after its own interests to see that justice is done to all concerned. This is a feature commending the undertaking to investors, for the reason that it precludes the necessity of their care and personal investigation of the standing of a distant road.

Of course nothing can be said for or against this new undertaking, or the chances of its ultimate failure or success; it is too radical a departure to allow of an off-hand expression of opinion. Nevertheless it is authoritatively announced that $90,000,000 of the proposed capital has already been taken up in European centers, as the new company has located its branches in all business parts of the world; and it is likewise said that the remaining $10,000,000 of the capital is to be offered to subscribers in this country in about eight weeks' time. Not that it is necessary to get more money than can be obtained abroad, but the company wishes to divide the stock between all large countries in order that a greater local interest in the undertaking may be assured. The charter of the new bank permits business of about every kind associated with money affairs, consequently it will have several departments distinct from the one partly described. Among its officers, as treasurer, is A. M. Scriba, who for 15 years was the U. S. bank examiner for this district. The colossal capital claimed to have been already obtained certainly attracts interest, if nothing further may be said about it.

After being dormant for a long while, the pig iron warrant dealings on the Consolidated Stock and Petroleum Exchange have taken a fresh start. Oil as a medium for the extraction of funds from the general public has lost its charms, and a new "chip" is to be used. So far as the iron manufacturers are concerned, this movement must be noted with regret. We doubt whether as yet there is any chance of success for those who want to make pig iron a speculative commodity. The principal obstacle thereto remains, the fact that the number of chips is too small to serve as the basis for large transactions. What sufferings gambling in warrants may impose upon the manufacturers of pig iron has been only too clearly shown during the past year. The speculation which forced prices upward so readily brought with it rapid advances in the cost of raw material and in wages. The drop came suddenly and has left the manufacturers with plants running at a heavy loss. The English makers have suffered severely and are naturally casting about for some remedy, an undertaking practically hopeless. American producers should heed the lesson and do all in their power to discourage the growth of a similar system, yet it must be frankly acknowledged that the obvious tendency of the times is against them. But the evil day may be postponed for a considerable period. What speculation by those engaged in the trade, and therefore less dangerous, can do in the way of unduly depressing values was pretty well shown this spring, in the drop in steel billets and Bessemer pig, notably in the West.

The May Meeting of the Iron and Steel Institute.

The May meeting of the Iron and Steel Institute in London, reports of which have just reached us, was characterized by some of the discussions which have made that body so famous in the metallurgical world. Aside from more abstruse papers like those of Osmond, of Paris, on "The Critical Points of Iron and Steel," by Prof. M. C. Roberts-Austen on "The Carbonization of Iron by the Diamond," and by Dr. E. J. Hall on "The Changes in Iron Produced by Thermal Treatment," there were some dealing more directly with practical questions, as those of W. Galbraith, of Chesterfield, on "Certain Chemical Phenomena in the Manufacture of Steel," and by A. Rollet, of Paris, on a "Process for Producing Purified Castings." W. J. Keep, of Detroit, was represented by a contribution on "Aluminum in Carburetted Iron."

Still, it is not too much to say that the principal interest in the meeting was centered in the discussions in which eminent men appear to take a part with a freedom too little known in this country. Such an exchange of experience and opinion is apparently limited, so far as our own country goes, to the shop talk of small groups as an incident of gatherings of iron men. Unfortunately they are lost to the profession generally.

Among the valuable contributions to one of the burning questions of the day was that of James Riley, of the Steel Company of Scotland. His remarks on the use of aluminum in the manufacture of open hearth steel, of which he is probably the largest producer in the world, were to the point. While he conceded that steel made with not more than 1 per cent. of aluminum has a higher breaking strain, a considerably higher elastic limit and more ductility, he stated that these points were not ordinarily of so great value in real use as they appear to be sometimes in making the experiment. The influence of aluminum in a large charge of 10 to 15 tons begins to be dissipated before the end of the charge in casting is reached. In steel making he bluntly announced as the result of his experience that aluminum would not prove advantageous to him or to any

one else, except for thin, small, light castings. Mr. Riley has, during the past two years, given much attention to the employment of nickel as an ingredient of steel, and it may be of interest to note that he has found that the most perfect way of making an alloy of nickel and steel is to use aluminum at the end of the charge.

Mr. Galbraith's paper was an effort to attribute certain difficulties in casting steel and in quieting the metal, to the presence in it of oxides of iron, on the ground that the latter, being practically infusible, led to quick chilling. He claims that it is necessary to keep the slag as basic as possible, so as to avoid cold and "lively" metal, to reduce the loss of iron and make a slag higher in phosphoric acid and therefore more valuable. Mr. Galbraith's claim that in making basic open hearth steel there is difficulty in controlling the carbon in the steel and that there is a larger consumption of spiegeleisen and ferromanganese was rather roughly handled. E. Windsor Richards threw the weight of his authority against the latter proposition, noting the results obtained in quieting steel and cutting down the consumption of manganiferous material by additions of pig carrying silicon.

Mr. Gilchrist alluded to the Deby process of making high carbon steel in the basic open hearth by adding at the end of the operation sufficient ferromanganese to give 0.3 to 0.4 per cent. of manganese, and then filtering the product through a sufficient weight of carbon to give any percentage of it desired up to 1 per cent. This process is in use at Brymbo and at the Phœnix Works, at Ruhrort. From outside sources we learn that much importance is attached to it. One of the speakers during the discussion stated, however, that in his experiments with it trouble was met with in getting the desired carbon with any regularity.

So far as it is possible to judge from the somewhat crude translation of the Rollet paper, the process is that already alluded to as in use in certain districts in France, of melting down pig iron in a cupola, at high temperatures, with admixtures of limestone, lime, iron ore or fluorspar. Rollet uses a syphon tap, and claims a practically complete elimination of the sulphur in the pig, and a reduction of the phosphorus by 80 to 85 per cent. Hugh Bell stated that at the Clarence Works experiments carried out in a similar way confirmed the elimination of sulphur; but his experience with phosphorus was different, since only a small portion disappeared. Still the process of melting pig iron at high temperatures with lime additions in a cupola is important, since it is likely to prove a simple way out of a serious difficulty in some localities in the adoption of the basic process. Ores high in sulphur need for the elimination of that element in the blast furnace heavy lime charges, which imply high temperatures, and therefore high silicon in the pig. Now the latter element, beyond a certain low limit, is decidedly undesirable for the basic process, since it tends to rapid destruction of the basic linings. The Rollet cupola process overcomes this by allowing a greater percentage of the sulphur in the pig.

We cannot help noting that on a number of occasions during the London meeting of the Iron and Steel Institute incidents appear to have occurred in which that great body is profoundly interested in the forthcoming visit to this country. We print elsewhere information touching it which shows clearly how distinguished a gathering it is sure to be. It is not too much to say that never has there been in any great industry so great an assemblage as that which will hold its international sessions at Pittsburgh in October. American ironmasters and engineers realize it, the leading men throughout the country taking an active part in insuring a success worthy of our guests and of ourselves.

Banking Our Furnaces.

We print elsewhere a letter written by a well-known pig iron manufacturer of long experience in Eastern and in Western Pennsylvania. It brings up a subject worthy of thorough consideration. Our correspondent proposes that the blast furnaces of this country be banked for a period of two weeks, the object being to restrict production sufficiently to give strength to the market for a long period to come. No one familiar with the iron trade will for a moment question that two weeks' stoppage would completely change the tone of both sellers and buyers. It may be conceded that production is in excess of the demand, but the quantity involved is relatively very small. Cut out 100,000 tons a week for two consecutive weeks and all danger of demoralization is put aside for months to come. There can be little question of the efficacy of such a measure. Whether it is all practicable is quite another matter. A former sustained and well conducted effort in the same direction, made years since, when its necessity was even more pressing, finally failed.

We believe that at the outstart a proposal of the character brought forward by our correspondent should deal with the certainty that only a proportion of the furnaces will accede to it. Steel works running on the direct process with orders to fill could hardly be expected to bank their furnaces. Plants run in connection with, and as feeders of raw material to mills, would hardly agree to suspend production of one part of the system.

Then there is one class of makers, probably not numerous, but powerful so far as their influence goes. They are those who are financially weak, who must run to keep afloat. While they would be the chief beneficiaries of a general banking of the furnaces, they would under one pretext or another keep producing. The knowledge that a few are sure to act in this manner would be likely to weigh seriously with others, particularly their immediate neighbors and competitors.

Any proposal looking toward a general banking of furnaces should be restricted to those plants which produce chiefly or exclusively for the open market. They are more directly, more keenly interested in the success of such a scheme. Whether the makers in the different sections who produce foundry and forge irons would be willing, even under such restrictions, to commit themselves in sufficient numbers to justify a serious effort remains to be seen. The results to be reaped are certainly very great, and would justify earnest, concerted action.

CORRESPONDENCE.

The Early History of the Gogebic Range.

To the Editor: In your issue of May 1 there appears an article entitled "The Gogebic Iron Range," which article, while giving the present standing of the range correctly and creditably, does not deal so fairly with the past history of the range. The writer is evidently not governed by any ill will, but by incorrect information, or possibly the lack of information. The statement I herewith send you is prompted by a desire to do honor and justice to the man whose persistent efforts resulted in opening up the Gogebic range. I am not willing to see an injustice done to Captain N. D. Moore while I have the ability to correct it.

The writer of the article, in a labored manner, seeks to give the world some new information regarding the discoverer of the range, and endeavors to transfer that honor from Captain N. D. Moore to "Old Dick Langford." Now, those who are acquainted with the early developments of the Gogebic range find nothing new in regard to Dick Langford having lived in the solitudes of Northern Michigan for a great many years past, nor is there anything new in the fact that he was conscious that the country was evidently rich in iron, but he is no more the discoverer of the Gogebic range than are the scores of Indians who also knew the same facts that Mr. Langford knew. It is not true that Mr. Langford ever took from the range specimens of clean ore to Ontonagon, Rockland, Houghton, or any other town in Northern Michigan. He simply took what any other man could find to-day in various places, float and croppings indicating ore deposits. His knowledge of this fact, however, never did the world any good, and if only Dick Langford and the Indians had known of the existence of iron indications in that wild country the Gogebic range would be absolutely unknown to the world to-day.

It is to Captain Moore, and to Captain Moore alone, that the honor justly belongs for discovering the iron deposits of the Gogebic range. He is the first man that ever showed to the world clean, merchantable ore. The writer of the article is very much mistaken in saying that it was only a little previous to 1884 that Captain Moore heard of the Gogebic iron deposits. Let me state to you as a matter of history that Captain Moore explored this country in search of iron ore as far back as 1872, and that while superintendent of the La Pointe Iron Company he entered the lands of the Northern Chief Iron Company and also the land on section 16, which is now known as the Colby mine, in the same year. Other lands were entered by him in 1874 and again in 1875. I think, therefore, I am warranted in saying that had it not been for Captain Moore the probabilities are that the Gogebic range would be unknown to the world to-day. Langford was never looking for iron ore. He was an eccentric character who enjoyed a wild life, and was much more interested in locating occasionally a valuable strip of heavy pine timber than he was in iron matters.

It is claimed, you know, by the Norsemen that Leif Erickson discovered America, but if he did it never was known to the world and has never done the world an iota of good; yet many would like to take the honor from Christopher Columbus and transfer it to the Norseman, but the universal sense of justice in the world will always recognize Columbus as the real discoverer of the new world, and, although he never set foot on this continent, yet he was in truth its discoverer, and the honor is all the greater belonging to him because he discovered it after having spent years of hardship in theorizing upon what proved to be a great truth, and in the heroic determination to prove or disprove his theory, he discovered the New World.

Captain Moore made several journeys to the Gogebic country and endured hardships which few men could have lived through, and he did it because he had noticed after heavy showers all the creeks and small rivers in that section were red with the oxide of iron, and because he firmly believed that there was an immense deposit of iron ore somewhere in that section, and he persistently continued, and I may say heroically continued his explorations and researches until he discovered clean ore on Section 16. From that time on he became an enthusiast, and it was this enthusiasm that enlisted my attention and crystallized my faith in the great possibilities that were then before us.

Whatever the early history of the range may have been, whatever mistakes may have been made, the big, solid, indisputable fact remains, that through the efforts of Captain Moore and his associates the Gogebic range is now known to the world, and has and is proving itself to be the largest deposit of high grade Bessemer ore to-day known to the world, and will doubtless ship 3,000,000 tons of merchantable ore this year. It is a matter of just pride to both Michigan and Wisconsin, and whatever honors and credit may be given to Mr. Langford, they need not and cannot in any way tarnish the well earned honors which belong to Captain Moore, for he was and is and must be known in history as the pioneer and discoverer of the Gogebic range.

Allow me to correct another misstatement of your correspondent, in which he states that Captain Moore is now in charge of iron mines in Canada, and assigns me to South America. Let me say to you that Captain Moore is now engaged in the iron business at Staunton, Va., and that I am not in South America, never have been and never expect to be, but I am still at the old stand in Milwaukee, and have no apologies to make to the world for the part I have taken in the development of the Gobegic iron range. It was done earnestly and enthusiastically, and while some of the results were discouraging for the time being, the final outcome has justified every statement ever made by me regarding the property. I never was connected with a mine that has not proved to be a valuable property, neither was Captain Moore, although a score of opportunities presented themselves to me to have made almost any amount of money had I been disposed to favor questionable schemes. If there is justification and satisfaction to the mind of man in Shakespeare's statement that "all is well that ends well," surely everybody connected with the discovery, early explorations and final development of the great Gogebic range should be happy and satisfied with the present results and proud of the great future awaiting the range.

"To lose with high endeavor is to win;
They only fail who build success on sin."

Respectfully yours,
JOHN E. BURTON.

MILWAUKEE, Wis., *May* 22, 1890.

A Proposal to Bank the Furnaces.

To the Editor: SIR: In common with other iron manufacturers, I notice with a degree of satisfaction that the tone of your recent editorials has been in favor of a reasonable advance in all grades of iron and steel. Unfortunately, for a while, the exceedingly "bearish" reports that were repeated from week to week only increased the demoralization—which was already sufficiently great—in the iron market. I know of instances where these "bearish" reports only caused buyers who were satisfied that sufficiently low prices had been reached to decline to purchase, and wait for further declines. Is it not time, in view of the great importance of this industry in its effects upon the railroads and other industries, and the large amount of capital invested, that there should be a more determined effort to get the whole trade on such a basis that there will be at least a moderately fair profit yielded on the volume of business transacted? It is conceded, even by the "bearish" buyers of pig iron, that but few furnaces can to-day hold their own; but those same mill and foundry owners have lost sight of the fact that their determined efforts to reduce the prices of what to them is crude material has simply led the buying public to follow in their footsteps, and force down the prices of their products, insisting that cheap pig iron necessarily meant lower prices for merchant iron and castings. The result has been general demoralization in the trade in all its branches. Could not the whole tide be quickly turned and a healthy tone restored by concerted action on the part of all the furnace owners, in banking their furnaces for a period of two weeks? The stock of iron on hand May 1, 1890, notwithstanding the immense production, was over 70,000 tons less than the stock on hand May 1, 1889, and actually less than two weeks' product of all the furnaces in blast, as reported in the first instance. It seems folly that the great industry, possibly the greatest manufacturing industry in the country, should in all its branches be rendered so unsatisfactory and trying to those engaged in it, when so easy a remedy as two weeks' "banking" of the furnaces would cause an immediate improvement in prices. Even the buyers who have brought about the unsatisfactory condition would certainly be better pleased to have the bad results of their policy corrected. Can you, in connection with the American Iron and Steel Association, and the respective pig iron associations, bring about some early concerted movement in the line suggested? Considering the cost of production, pig irons are lower in price to-day than they were a year ago; $17.50, $18.50 and $20 should be low enough for Gray Forge 2 X and No. 1 X Foundry, delivered in New York, Philadelphia, and Pittsburgh, and then let the finished products be placed at prices in accord. Yours truly,

"IRON."

May 22, 1890.

Norton Fluid Rolling.—The Norton Fluid Metal Rolling Company, of Chicago, are meeting with very encouraging success in their experiments with steel. While much remains to be done to put this new system of manufacture on a commercial footing, the fact has now been demonstrated that the Norton process will roll liquid steel into sheets of true gauge, free from blow-holes or other defects, and with a surface wholly free from scale. Many of the difficulties which were expected to be encountered in the development of the process have proved to be easily surmountable. The first genuine trial of the process was made on the 9th inst., and it proved the correctness of the theories of the inventor, Mr. Edwin Norton.

Our Foreign Guests.

For a number of years American iron masters and engineers have cherished the plan to secure the holding of a meeting of the Iron and Steel Institute of Great Britain in this country. An invitation was extended last year by the Council of the American Institute of Mining Engineers, supported by the American Iron and Steel Association, the American Society of Civil Engineers, the American Society of Mechanical Engineers and the United States Association of Charcoal Iron Workers. An invitation was also extended to the Verein Deutscher Eisenhüttenleute, and in the absence of other similar bodies in the leading industrial countries, individually to prominent metallurgists.

The following members of the Iron and Steel Institute have accepted the invitation:

MEMBERS OF COUNCIL.

President, Sir James Kitson, Bart.
Sir Lowthian Bell, Bart., F.R.S.
Lord Edward Cavendish, M.P.
Edward P. Martin.
E. Windsor Richards.
G. J. Snelus, F.R.S.
William Whitwell.
J. S. Jeans, secretary.

ORDINARY MEMBERS.

Adams, George, Wolverhampton.
Allen, Alfred H., Surrey street, Sheffield.
Anderson, Chris., 3 Belmont Grove, Leeds.
Anderson, Samuel, Westbury, Wilts.
Ashbury, Thomas, Ash Grove, Victoria Park, Longsight, Manchester.
Aspinall, John A. F., Fern Bank, Heaton, Bolton.
Baare, Fritz, Bochum, Westphalia.
Bain, Sir James, Glasgow.
Bain, James R., Harrington and Moresby Hall, Whitehaven.
Bamlett, A. C., Thirsk, Yorkshire.
Bantock, Thomas, Merridale House, Wolverhampton.
Barlow-Massicks, T., Millon, Cumberland.
Barnett, F. T., Salford, Manchester.
Barningham, T., 27 Corporation street, Manchester.
Bayard, Paul, Forges de Montataire (Oise), France.
Bayliss, M., St. Cuthbert's, West Heath, Hampstead, N. W.
Beardshaw, Wm. F., Sheffield.
Beckwith, John Henry, Knott Mill Iron Works, Manchester.
Bedford, Joseph, Haymarket Chambers, Sheffield.
Bell, C. E., Park House, Durham.
Bell, Hugh, Middlesbrough.
Bleichert, Adolf, Gholis, near Leipzig, Germany.
Bond, George, Nottingham.
Bradley, B. G., Parkfield House, Wolverhampton.
Brown, Joseph C., Hazel Holm, Cleator, Cranforth.
Brustlein, H. A., Unieux, Loire, France.
Buckley, James, Bryn-y-Caeran, Llanelly.
Buckton, Walter, 27 Ladbroke square, London, W.
Bull, James, Cliff Vale Iron Works, Stoke-on-Trent.
Burn, R. Scott, Oak Lea, Edgeley Road, near Stockport.
Burnyeat, Wm., Jr., Millgrove, Whitehaven.
Bush, George, Lea Park, Blackheath, Kent.
Butler, Isaac, Panteg House, near Newport, Monmouth.
Butler, T. F., Barrow-in-Furness.
Byers, W. L., 51 West Sunnyside, Sunderland.
Byles, A. R., Shipley, Yorkshire.
Campbell, D., Catford, London, S. E.
Cawley, George, 358 Strand, London, W. C.
Chatwood, Samuel, Bolton.
Cheesman, William T., Hartlepool.
Coghlan, John Henry, Grosvenor House, Headingley, Leeds.
Cooper, Arthur, N. E. Steel Company, Limited, Middlesbrough.
Cooper, Leonard, 32 Park Row, Leeds.
Copestake, J., 1 Adelaide Crescent, Brighton.
Corner, John, 18 Albert Road, Regent's Park, London, N. W.
Coventry, Joseph, 34 Linnet Lane, Liverpool.
Craven, John, Osborn street, Manchester.
Crawhall-Wilson, T. W., Alston House, Cumberland.
Croasdell, S. T., Workington.
Crosland, J. F. L., 67 King street, Manchester.
Crowther, Clement, Green Hill, Kidderminster.

Cunninghame, William, Belmont, Ayr., N. B.
Dalton, George, Regent Villa, Headingley, Leeds.
Darby, John H., Brymbo, near Wrexham.
Dawson, Bernard, Malvern Link, Malvern.
Dickinson, E., Meersbrook Bank, Sheffield.
Dickinson, S., Wolverhampton.
Dickson, John, Glaisdale, Yorkshire.
Dorman, A. J., Middlesbrough.
Dronsfield, William, 9 Alexandra Road, Oldham.
Duncan, D. J. R., 10 Airlie Gardens, Kensington, London, W.
Dunnachie, James, 4 West Regent street, Glasgow.
Eadon, R. R., President Works, Sheffield.
Easton, Edward, 11 Delahay street, Westminster, London, S. W.
Eccles, Herbert, Briton Ferry, Glamorgan.
Edge, J. H., Coalport Iron Works, Shifnal, Salop.
Edwards, Daniel, Daffyn Tin Plate Works, Morriston, R.S.O.
Edwards, W. H., The Poplars, Morriston, Glamorgan.
Ellis, T. Leonard, North British Iron Works, Coatbridge, N. B.
Evans, Christmas, Merthyr Tydvil.
Evans, R. K., Whiston Grange, Rotherham.
Farley, Reuben, West Bromwich.
Farnworth, W., Swindon, near Dudley.
Fellows, S. J., Compton, Wolverhampton.
Fossick, W. G., 86 Cannon street, London, E.C.
Fry, Theodore, M.P., Darlington.
Garrett, George, Dunluth Lodge, Coatbridge.
Geen, George, Ivor Villa, Newport, Monmouth.
Goransson, A. H., Sandviken, Sweden.
Goulty, Wallas A., Albert Chambers, Albert Square, Manchester.
Green, John, Abercarn, Monmouthshire.
Greenwood, W. H., Birmingham Small Arms and Metal Company, Limited, Birmingham.
Gregory, Joseph, Whalley Cottage, Upper Chorlton Road, Manchester.
Gubbins, R. R., North Kent Iron Works, Erith.
Hadfield, R. A., Sheffield.
Haggie, D. H., Sunderland.
Hall, J. F., Norbury, Sheffield.
Hall, W. F., Haswell, via Sunderland.
Hansell, R. B., 19 Moor Oaks Road, Broomhill, Sheffield.
Hanson, W., Middlesbrough.
Harrison, G. H., Hagley, near Stourbridge.
Harrison, G. K., Hagley, near Stourbridge.
Harrison, W. B., Aldershaw, Lichfield.
Hay, Alex. M., 37 Walbrook, London, E. C.
Head, Jeremiah, Queen's Square, Middlesbrough.
Heath, R., Jr., Stoke-on-Trent.
Hellon, Robert, 47 Lowther street, Whitehaven.
Hills, A. F., Blackwall, London, E.
Hobson, J. F., Washington Iron Works, County Durham.
Hollingsworth, James, Wood House, Dobcross, Oldham.
Holtzer, Louis, Unieux, Loire, France.
Hosking, Richard, Clarence House, Dalton-in-Furness.
Houghton, John, The Beeches, Moore, near Warrington.
Houldsworth, James, Coltness, Wishaw, N. B.
Hoyle, J. Rossiter, Norfolk Works, Sheffield.
Hulse, J. W., Ordsal Works, Salford, Manchester.
Hunt, Charles, Gas Works, Windsor street, Birmingham.
Huntington, A. K., King's College, Strand, London, W. C.
James, C. Henry, 8 Courtland Terrace, Methyr Tydvil.
Jameson, John, Akenside Hill, Newcastle-on-Tyne.
Jefferies, J. R., Ipswich.
Jenks, J. Jas., Cleveland Iron Works, Wolverhampton.
Jenks, Walter, Wolverhampton.
Johnston, James, 16 Risley street, Macclesfield.
Keay, Ernest C., Birmingham.
Keen, Arthur, London Works, near Birmingham.
Kidner, John, Islip House, near Thrapston.
Koch, Francis, Alexandroswky Steel Works, St. Petersburg.
Korb, Fr., Durer Villa, Spring Hill Road, Sheffield.
Laybourne, R., The Firs, Malpas, Newport, Monmouth.
Lewis, H. W., Llwyn-yr-Eas, Merthyr Tydvil.
Lewis, Sir W. T., Aberdare.
Lloyd, Samuel, Farm, Sparkbrook, Birmingham.
Lowood, J. G., Sheffield.
Lyon, Alfred C., Southbank, Compton, Wolverhampton.
Manby, Cordy, Wassell Wood, Bewdley.
Macarthy, G. E., Ashfield House, Newcastle-on-Tyne.
Margery, Jules, Rothe Erde, near Aix-la-Chapelle.
Marsden, Benjamin, Altrincham street, London Road, Manchester.
Marshall, R. C., Newton, Lanarkshire, N. B.
Massey, W. H., Twyford, R.S.O., Berks.
Matheson, Ewing, 14 Clarendon Road, Leeds.
M'Gowan, Wm., Sorbie, Corkickle, Whitehaven.
Miller, Thos., Edinburgh.
M'Laren, Charles, 3 New Court, London, W.C.
Molineaux, Wm., Capponfield Iron Works, Bilston.
Monks, Fred'k, Walton Old Hall, near Warrington.
Moore, Alfred, 360 Euston Road, London, N.W.
Morgan, S. V., 42 Cannon street, London, E.C.
Morris, Claude, J., The Mount, Altrincham.
Mosley, Col. Paget, 27 St. James' Square, London, S.W.
Muller, T. N., Roslyn Villas, Saltburn-by-the-Sea.
Nettlefold, Jno. S., Castle Works, Tydu, near Newport, Monmouth.
Norbury, W. E., Chorlton-cum-Hardy, Lancashire.
Oakes, Gerard O., Holly Hurst, Alfreton, Derby.
Ogilvie, G., 4 Great George street, Westminster, London, S.W.
Page, John, Penkridge, near Sheffield.
Parker, Wm., 2 White Lion Court, Cornhill, London, E.C.
Parkes, Henry P., Tipton, Staffordshire.
Pattison, John, Naples, Italy.
Pearson, J. H., Handsworth, Birmingham.
Pearson, T. H., Newton-le-Willows.
Pease, Jno. Francis, Darlington.
Pease, Jos. A., Southend, Darlington.
Peile, Wm., Cartgate, Whitehaven.
Platt, James, Gloucester.
Pope, Samuel, Tinsley Terrace, Tinsley, Sheffield.
Pourcel, Alex., Saltburn-by-the-Sea.
Preston, F. W., The Poplars, Burton.
Price, John, 6 Osborne Villas, Newcastle-on-Tyne.
Pye-Smith, Arnold, 32 Queen Victoria street, London, E.C.
Ratliffe, G., 139 Cannon street, London, E.C.
Reed, Sir E. J., Broadway Chambers, London, S. W.
Renton, B. M., Sheffield.
Richards, J., Havelock House, Acocks Green, near Birmingham.
Richardson, George, 98 Westbourne Terrace, London, W.
Richardson, Joseph, Potto Hall, Northallerton.
Ridehalgh, G. J. M., Fell Foot, Newby Bridge, Ulverston.
Riley, Edward, South Heath, Hamstead Road, London, N. W.
Robinson, T. N., Rochdale.
Rogers, J. H., Llanelly.
Rummens, Charles, 8, Oldfield Terrace, Acton, London, W.
Rummens, Francis W., Shirley, Southampton.
Scoular, George, Hensingham, Whitehaven.
Seaman, Frederick, Sheffield.
Senior, George, Ponds Forge, Sheffield.
Siddell, George, Roewood, Pitsmoor, Sheffield.
Siemens, A. L., 10 Queen Anne's Gate, Westminster, London.
Siemens, Frederick, 10 Queen Anne's Gate, Westminster, London.
Simon, Henry, 20 Mount street, Manchester.
Simpson, H. C., Horsehay, R. S. O., Shropshire.
Smith, Frederick, Caledonia Works, Halifax, Yorkshire.
Smith, G. J., Clyde Steel Works, Sheffield.
Smith, Robert, Castle Hill, Sheffield.
Smith, W. Ford, Gresley Works, Ordsal Lane, Salford.
Soldenhoff, R. de, 71 St. Mary street, Cardiff.
Sorby, T. W., Storthfield, Sheffield.
Sparrow, John W., Beckminster, Wolverhampton.
Spencer, John W., Phœnix Iron Works, Coatbridge, N. B.
Spencer, John W., Globe Tube Works, Wednesbury.
Squire, E. L., Coalbrookdale, R. S. O., Salop.
Squire, L. R. L., 30 St. John's Wood Park, London, W.
Steel, Henry, Jr., Sheffield.
Steer, Edward, Castle Works, Rogerstone, Newport, Monmouth.
Storey, Edgar, 7 Oriel Chambers, Liverpool.
Storey, Sir Thomas, Lancaster.
Storey, W. J. P., Douglas House, Rhyl.
Storr, W., 21 The Groves, Chester.
Summers, J. W., Staleybridge.
Sumner, William, 2 Brazenose street, Manchester.
Tate, John, Workington.
Taylor, J. S., Derwent Foundry, Birmingham.
Thackray, W., 7 The Avenue, Sunderland.
Thomas, Jno. G., Llangennech, R.S.O., Carmarthen.
Tozer, Wm., Phœnix Bessemer Steel Works, Sheffield.
Wake, Henry, Wear Commission, Sunderland.
Walton, Joseph, Zetland Building, Middlesbrough.
Webb, Henry, Bury, Lancashire.
Wells, Charles, Moxley, Wednesbury.
Whittle, John, Yarrow House, Chorley, Lancashire.
Whitwell, Wm. F., Stockton-on-Tees.
Wilkinson, Geo., 36 Lowther street, Whitehaven.
Wilkinson, Geo. W., Risca, Newport, Monmouth.
Willians, John W., 28 Deansgate, Manchester.
Williams, Illtyd, Linthorpe Iron Works, Middlesbrough.
Williams, James, The Fields, Newport, Monmouth.
Williams, Peter, Brymbo Steel Works, Wrexham.
Williams, Wilfred, New Hall Works, Birmingham.
Williams, Wm., New Forest Steel and Tin Plate Works, Swansea.
Williamson, R. W., Workington.
Wilson, Alfred, N. Grange, Horsforth, by Leeds.
Wood, B. G., Wardsend Steel Works, Sheffield.
Woolcock, H., Rickerby House, St. Bees.
Worton, Jas., Blaenavon Works, Monmouth.
Wrightson, T. Norton Hall, Stockton.
Ybarra, José A. de, Madrid, Spain.

The members of the Verein Deutscher Ingenieure who have signified their intention to attend the meetings are the following:

Ahlemeyer, Georg, Bilbao, Spanien.
Berninghaus, Caspar, Duisburg.
Bischoff, Felix, Duisburg a. Rh.
Blass, E., Essen.
Buch, Julius, Metz.
Büscher, H., Caternberg bei Altenessen.
Brauns, H., Dortmund.
Bredt, Rudolf, Wetter a. d. Ruhr.
Bueck, H. A., Berlin W.
Burgers, F. E., Bulmke bei Gelsenkirchen.
Corleis, Dr. E., Essen a. d. Ruhr.
Daelen, Rudolf, Heerdt bei Neuss.
Daelen, R. M., Düsseldorf, Kurfürstenstr. 9.
Dauber, Aug., Bochum.
Deussen, W., Hüsten bei Arnsberg.
Diechmann, G., Berlin.
Eckardt, A., Düsseldorf.
Eckstein, Heinr. A., Leipzig.
Ehrhardt, B., Bockwa bei Cainsdorf in Sachsen.
Eickhorn, K., Berlin W.
Erkenzweig, Gustav, Hagen i. W.
Esser, W., Zawadzki, O.-S.
Fischer, M. F., Magdeburg-Buckau.
Fleitmann, Dr., Iserlohn.
Frank, Ad., Düsseldorf.
Geisler, A., Düsseldorf.
Goedicke, Ed., Schwechat bei Wien.
Gregor, Georg, Bonn.
Grosser, P., Heinitz.
Guilleaume, Emil, Mülheim a. Rhein.
Guilleaume, Max, Mülheim a. Rhein.
Haas, O., Neuhoffnungshütte bei Sinn i. N.
Haedicke, Heom, Remscheid.
Hallbauer, Lauchhammer.
Haniel, Hugo, Düsseldorf.
Hassel, Wilhelm, Hagen i. W
Herbertz, F. A., Köln.
Huffelmann, Wilh., Germaniahütte bei Grevenbrück.
Hüssener, A., Bulmke bei Gelsenkirchen.
Imperatori, Luigi, Milano.
Irle, H., Oberhausen II.
Joseph, Ludwig, Frankfurt a. Main.
Kaltenbach, Jos., Aachen.
Kieser, Joseph, Duisburg.
Kiesselbach, C., Duisburg.
Klein, Ernst, Dahlbruch bei Siegen.
Klein, Robert, Heinrichshütte bei Au a. d. Siegen.
Klönne, Aug., Dortmund.
Krabler, Bergassessor, Altenessen.
Küpper, C., Duisburg-Hochfeld.
Lämmerhirt, Warstein.
Langen, Albert, Köln.
Langen, Eugen, Köln.
Lehment, W., Düsseldorf.
Leistikow, B., Eulau, Schlesien.
Lentz, Gust., Düsseldorf.
Liebrecht, St. Johann a. d. Saar.
Lueg, H., Düsseldorf.
Lueg, Dr. Paul, Dortmund.
Lührmann, Fr. W., Ruhrort.
Lürmann, Fritz W., Osnabrück.
Macco, Heinr., Siegen.

Magery, Moritz, Rothe Erde bei Aachen.
Menne, Gustav, Siegen.
Merker, Julius, Oberhausen II.
Metz, Düsseldorf.
Meyer, Carl, Dortmund.
Mischke, C., Weilburg a. d. Lahn.
Müller, Paul, Oberhausen.
Narjes, Th., Kupferdreh (Ruhr).
Orenstein, Max, Berlin.
Othberg, Eduard, Eschweiler.
Platz, H., Zweibrücken.
Piedboeuf, G., Aachen.
Piedboeuf, Paul, Düsseldorf.
Poensgen, Arthur, Düsseldorf.
Poensgen, Emil, Düsseldorf.
Pohlig, J., Siegen.
Rachel, Wilh., Potschappel b. Dresden.
Reinhard, O., Ternitz, bei Wr.-Neustadt.
Remy, Heinrich, Hagen i. W.
Remy, Richard, Heinitz, Reg.-Bez. Trier.
Reuss, Herm., Louvière, Belgien.
Rexroth, Fr., Saarbrücken.
Röchling, Fr., Völklingen a. d. Saar.
Röchling, Rudolph, Ludwigshafen a. Rhein.
Schiele, Friedrich, Giessen.
Schiefs, E., Düsseldorf.
Schilling, Alfr., Oberhausen.
Schlink, J., Mülheim a. d. Ruhr.
Schmeisser, Altena.
Schneider, Albert, Witten a. d. Ruhr.
Scholten, Th., Meiderich.
Schrödter, Emil, Düsseldorf.
Schurmann, W. R., Düsseldorf.
Schulte, Wilh., Duisburg.
Schultz, F., Köln Deutz.
Schulz, O., Salgó-Tarján, Neograder Comitat, Ungarn.
Senff, Emil, Heerdt bei Neuss.
Sorge, Kurt, Rombach.
Spannagel, A., Laar.
Strippelmann, Leo, Berlin.
Stühlen, Peter, Deutz.
Talbot, George, Aachen.
Thielen, Alexander, Laar bei Ruhrort.
Von Kruewel, Ottokar, Ruhrort.
Wayss, G. A., Berlin.
Weber, Jul., Betzdorf bei Siegen.
Wedding, Professor, Dr. H., Berlin.
Wegeler, Coblenz.
Zeidler, A., Dortmund.
Zurborn, Julius, Neuwied.

The American committee have been organized as follows:

CHAIRMAN: Andrew Carnegie, New York.
TREASURER: George A. Crocker, New York.
SECRETARY: C. Kirchhoff, Jr., New York.

Thus far the following have accepted membership of the Central Committee and of the General Committee respectively:

CENTRAL COMMITTEE.

Hon. Abram S. Hewitt, president of the American Institute of Mining Engineers.
B. F. Jones, president of the American Iron and Steel Association.
W. P. Shinn, president of the American Society of Civil Engineers.
Oberlin Smith, president of the American Society of Mechanical Engineers.
W. N. McGugin, president of the United States Association of Charcoal Iron Workers.
Dr. R. W. Raymond, secretary of the American Institute of Mining Engineers.
James M. Swank, secretary of the American Iron and Steel Association.
John Bogart, secretary of the American Society of Civil Engineers.
F. R. Hutton, secretary of the American Society of Mechanical Engineers.
John Birkinbine, secretary of the United States Association of Charcoal Iron Workers.
J. C. Bayles, East Orange, N. J.
A. E. Hunt, Pittsburgh, Pa.
Dr. T. Sterry Hunt, New York.
Prof. Henry Morton, Stevens Institute of Technology, Hoboken, N. J.
Charles Macdonald, 1 Broadway, New York.
David Williams, New York.
R. H. Coleman, Lebanon, Pa.
Eckley B. Coxe, Drifton, Pa.
John Fritz, Bethlehem, Pa.
O. W. Potter, Chicago, Ill.
Henry S. Pickands, Chicago.
Charles Himrod, Chicago.
R. W. Hunt, Chicago.
Wm. Chisholm, Cleveland, Ohio.
Samuel Mather, Cleveland, Ohio.
G. W. Goetz, Milwaukee, Wis.
R. A. Parker, Marquette, Mich.
F. H. DeBardeleben, Bessemer, Ala.
H. S. Chamberlain, Chattanooga, Tenn.
Walter Crafts, Anniston, Ala.
Judge H. G. Bond, Birmingham, Ala.
Gen. Fitzhugh Lee, Lexington, Va.
James A. Burden, Troy, N. Y.
Jos. D. Weeks, Pittsburgh.
F. S. Witherbee, Port Henry, N. Y.
S. W. Baldwin, New York.
J. F. Holloway, New York.
James F. Lewis, 23 Park place, New York.
John Stanton, New York.
Ferdinand Schlesinger, Milwaukee, Wis.
A. M. Shook, Nashville, Tenn.
John H. Ricketson, Pittsburgh.

GENERAL COMMITTEE.

Fred. W. Gordon, Philadelphia.
Wm. L. Abbott, Pittsburgh.
Geo. I. Magee, Corning, N. Y.
B. G. Clarke, 52 Wall street, New York.
T. Guilford Smith, Buffalo, N. Y.
F. W. Roebling, Trenton, N. J.
W. O. Fayerweather, Paterson, N. J.
Wm. H. Wallace, New York.
William Sellers, Philadelphia.
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Louis Lee Stanton, New York.
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I. P. Pardee, Secaucus, N. J.
Alfred Earnshaw, Philadelphia.
E. D. Meier, St. Louis, Mo.
Wm. B. Potter, Washington University, St. Louis.
Lewis Miller, Akron, Ohio.
Thomas A. Edison, Orange, N. J.
Benjamin Atha, Newark, N. J.
M. A. Hanna, Cleveland, Ohio.
Austin A. Wheelock, Boston, Mass.
Geo. A. Ely, Cleveland, Ohio.
Alexander Maitland, Negaunee, Mich.
Edward Walsh, Jr., St. Louis.
E. S. Moffat, Scranton, Pa.
J. Thorpe Potts, Philadelphia.
Hon. F. G. Niedringhaus, Washington.
John Daniell, Opechee, Mich.
F. J. Hearne, Wheeling, W. Va.
Geo. T. Barns, Philadelphia.
J. M. Longyear, Marquette, Mich.
S. S. Curry, Milwaukee, Wis.
Hon. James McMillen, Washington.
Thomas Seddon, Birmingham, Ala.
A. Tower, Poughkeepsie, N. Y.
Wm. Thaw, Jr., Pittsburgh.
Walter E. Koch, Sharpsburg, Pa.
J. J. Pierce, Sharpsville, Pa.
Smith M. Weed, Plattsburgh, N. Y.
F. G. Coggin, Lake Linden, Mich.
Homer R. Stoughton, Shelby, Ala.
Johnson Vivian, Calumet, Mich.
Enoch Ensley, Memphis, Tenn.
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W. S. Russel, Detroit, Mich.
Joseph L. Colby, Milwaukee, Wis.
C. M. Roepper, Alliance, Ohio.
A. C. Rand, 23 Park place, New York.
A. S. Bigelow, Boston.
Judge H. G. Bond, Birmingham, Ala.
Jawood Lukens, Conshohocken, Philadelphia, Pa.
T. C. Platt, New York.
Chas. Donnelly, Pittsburgh, Pa.
Geo. Jamme, Dayton, Tenn.
Philip W. Moen, Worcester, Mass.
Wm. G. Park, Pittsburgh, Pa.
Edwin Pechin, Roanoke, Va.
J. E. Johnson, Longdale, Va.
O. Chanute, Chicago.
Chas. B. Dudley, Altoona, Pa.
R. Forsyth, Chicago.
Lee Burt, Detroit, Mich.
A. E. W. Painter, Pittsburgh.
Jones Wister, Philadelphia.
Oliver Williams, Catasauqua, Pa.
W. E. C. Coxe, Columbus, Ohio.
Charles Ridgely, Springfield, Ill.
L. S. Colyar, Chattanooga, Tenn.
J. Tatnall Lea, Philadelphia.
Samuel Mather, Cleveland, Ohio.
Theodore Voorhees, New York.
Walter Katte, New York.
D. J. Whittemore, Milwaukee, Wis.
Percival Roberts, Jr., Philadelphia.
Fred. Sloss, Birmingham, Ala.
H. S. Chamberlain, Chattanooga, Tenn.
E. C. Felton, Steelton, Pa.
Andrew S. McCreath, Harrisburg, Pa.
Richard Pearce, Denver, Col.
Robert H. Coleman, Cornwall, Pa.
Charles Paine, Pittsburgh.
Jas. Hemphill, Pittsburgh.
H. H. Rogers, New York.
John R. Proctor, Frankfort, Ky.
Robert Leckie, Londonderry, N. S.
John Thomas, Hokendauqua, Pa.
H. C. Disston, Philadelphia.
Henry R. Towne, Stamford, Conn.
W. H. Jaques, Bethlehem, Pa.
Willard P. Ward, New York.
L. G. Laureau, New York.
Jerome Wheelock, Worcester, Mass.
Walter Wood, Philadelphia.
O. W. Potter, Chicago.
Irving M. Bean, Milwaukee, Wis.
R. H. Thurston, Cornell University, Ithaca, N. Y.
M. R. Hunt, Ashland, Wis.
Ralph J. Wick, Lancaster, Ohio.
C. M. Clark, Philadelphia.
W. L. Scaife, Pittsburgh.
Jerome L. Boyer, Reading, Pa.
E. D. Leavitt, Cambridgeport, Mass.
R. P. Rothwell, New York.
Jno. Fulton, Johnstown, Pa.
Wm. H. Morris, Pottstown, Pa.
Wm. H. Wiley, New York.
Edgar S. Cook, Pottstown, Pa.
R. H. Richards, Boston.
Chas. H. Cramp, Philadelphia.
Jacob Yost, Iron Gate, Va.
F. L. Lehman, New York.
Jas. Bowron, Nashville, Tenn.
David Reeves, Philadelphia.
Theo. N. Ely, Altoona, Pa.
R. Bentley, Lowellville, Ohio.
F. Firmstone, Easton, Pa.
Geo. G. McMurty, Pittsburgh.
G. Parke Channing, Bessemer, Mich.
Matthew Addy, Cincinnati, Ohio.
George W. Maynard, New York.
Joseph C. Platt, Waterford, N. Y.
Samuel Thomas, Birmingham, Ala.
J. E. Bramwell, Bramwell, W. Va.
Edward Cooper, 17 Burling Slip, New York.
H. C. Frick, Pittsburgh, Pa.
E. G. Spilsbury, Trenton, N. J.
S. T. Wellman, Cleveland, Ohio.
J. P. Witherow, Pittsburgh, Pa.
C. R. Boyd, Wytheville, Va.
W. J. Taylor, Philadelphia, Pa.
Thos. C. Clarke, New York.
D. M. Sabin, Stillwater, Minn.
Geo. F. Baer, Reading, Pa.
T. T. Hillman, Birmingham, Ala.
F. W. Wood, Steelton, Pa.
H. M. Howe, Boston.

The local committees are now being organized in the different sections to be visited by the party. The American Committee has arranged the following programme for excursions after the holding of the meetings:

DATES OF VISITS FIXED BY THE AMERICAN RECEPTION COMMITTEE.

New York Meeting of the American Institute of Mining Engineers, to which foreign guests are invited:
Monday, September 29,
Tuesday, September 30.
Meeting of the Iron and Steel Institute:
Wednesday, October 1, morning session.
Thursday, October 2, morning session.
Friday, October 3, morning session.
Saturday, October 4, Philadelphia.
Monday, October 6, Philadelphia.
Tuesday, October 7, Lebanon and Harrisburg.
Wednesday, October 8, Johnstown and Altoona.
Thursday, October 9,
Friday, October 10,
Saturday, October 11,
Sunday, October 12, Pittsburgh, including two International sessions.
Monday, October 13,
Tuesday, October 14, Chicago.
At Chicago the party will divide into two groups; one, the Northern (I), going to Lake Superior, and the other to the South (II).

NORTHERN TRIP.—I.

Wednesday, Otober 15, Chapin Mine and plant.
Thursday, October 16, Gogebic Iron Range.
Friday, October 17, and Saturday, October 18, Lake Superior Copper Mines, from Houghton.
Monday, October 20, and Tuesday, October 21, mines of Marquette Range.
Wednesday, October 22, Sault Ste. Marie Canal and locks.
Thursday, October 23, *en route* to Niagara.
Friday, October 24, Niagara Falls.
Saturday, October 25, New York.
Those of this party who desire will be conveyed to Washington and return.

SOUTHERN TRIP.—II.

Leave Chicago Tuesday night, October 14, arrive Birmingham, Ala., late Wednesday, October 15.
Thursday, October 16, Friday, October 17, Birmingham, Ala.
Saturday, October 18, Shelby, Ala., and Anniston, Ala.
Sunday, October 19, Lookout Mountain.
Monday, October 20, Chattanooga.
Tuesday, October 21, Middlesborough, Ky., and Knoxville, Tenn.
Wednesday, October 22, The Pocahontas Coal Field.
Thursday, October 23, Roanoke, Va.
Friday, October 24, Luray Cave.
Saturday, October 25, Washington.
Sunday, October 26, Washington.
Monday, October 27, New York.
Those of this party who so desire will be conveyed to Niagara Falls, returning to New York, Wednesday, October 29.

The American Institute of Mining Engineers, it will be observed, holds its fall meeting just before the beginning of the sessions of the visiting body.

At Pittsburgh will be held two International sessions for the reading of papers

by the American and foreign engineers, the president of the Iron and Steel Institute to be in the chair during one of the sessions, while the president of the American Institute of Mining Engineers will preside over the second gathering.

Washington News.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., May 26, 1890.

The Democratic members of the Senate have decided to present the name of John G. Carlisle for the vacant place on the Committee of Finance, so long held by the late Mr. Beck. This action is not unprecedented, although it has not been taken for many years. Senator Morrill, of Vermont, author of the Morrill Tariff of 1861, was placed upon this committee upon the reorganization, incident to the expiration of the terms of some of its *personnel*, when he entered the Senate in 1867.

Senator Carlisle's selection is upon the merits of his ability and experience in tariff matters from the standpoint of the minority. It was his first purpose to close his career of 13 years in the House of Representatives in a speech upon the pending measure in that body, but at the suggestion of his friends he subsequently concluded to save his oratorical ammunition until the question comes up in the Senate. In speaking on the subject of his senatorship and his views on economic matters, the Senator says:

"I had no idea of entering into the senatorial contest when I went to Kentucky with the remains of my life-long friend, James B. Beck. When I left here Mrs. Carlisle was particularly anxious for me to remain in the house, but circumstances were such when I arrived at Lexington and met my old friends that they urged me to go to Frankfort, and there persuaded me to be a candidate. My position on the tariff question in the Senate will, of course, follow in the general line which I have always held in the House. I believe in tariff reform not in terms, but in fact, and shall advocate the dominant ideas of my party, with which I am in hearty accord. The position of my friends in the House, with whom I have always co-operated, shall be maintained in the Senate. How my colleagues in that body may receive these views remains to be seen, but it appears to me that a more aggressive policy might be a good one."

Although the Democrats of the Senate as a body are in line with their party on tariff reform several of the leaders, like Gorman Voorhees, McPherson and Payne, are decidedly conservative. It is possible that the influence of these gentlemen will be sufficient to remind the distinguished Kentuckian that he must not be too aggressive all at once. It is possible that Mr. Carlisle will find the Senate a poor field for such stalwart oratory and emphatic parliamentary methods as prevail in the House. There is no doubt that Mr. Carlisle will early demonstrate that he is the best equipped tariff expert in Senatorial circles, and will be a leader in that line on his side.

Senators Allison, Aldrich and Jones, who had charge of the "protracted meetings" on the tariff during the summer of 1888, have renewed the consideration of the Senate measure in connection with the House bill just received, and after a collateral consideration of both measures, will evolve a Senate substitute, which will be reported and discussed by this august body. The disposition to report a measure of their own arises from the opposition to the House bill in certain particulars, and an understanding between Senators and Representatives of certain localities that the points of disagreement should be adjusted.

Had not this understanding been reached there would have been more serious bolting. As it was, the bill received practically a solid party vote. Coleman, of Louisiana, a Republican, went off on sugar, and Featherston, seated by Republican votes over his Democratic contestant, went back on his parliamentary creators. The House bill is now in the Senate Committee on Finance. Senator Allison says it will be several weeks before the committee can report. He says that the action of the committee will be in the line of the committee of 1888. He believes in a thoroughly protective scheme.

Chairman McKinley feels quite happy over the passage of the House bill, as it relieves him from a great weight of responsibility. Several times during the vote matters looked very serious, particularly when one of the amendments having been carried against the committee, two votes were withdrawn to save the committee from defeat, and they then only had one majority.

The Senate Committee will give hearings in important cases, but it can be said that no changes will be made in rates to bring them under the figures of the House bill.

NEW ENGLAND NOTES.

The American Bolt Company, of Lowell, Mass., are especially busy on railroad work in bolts, nuts, screws, washers, forgings and kindred articles, to meet orders coming from the South, the increasing demand for such goods in that section being especially noticeable. The works give employment to 250 hands and are running full time. Orders for Mexico and some of the South American countries have recently been shipped by this company, while the multiplication of electric street railways in all parts of the country give rise to a rapidly increasing demand for bolts, brackets, &c., appurtenant thereto.

It is reported that the Spencer Arms Company, at Windsor, Conn., are soon to remove to Windsor Locks, Conn., where more room and better facilities for their business can be obtained.

W. C. and E. P. Carpenter have moved their tool factory from Laconia, N. H., to St. Johnsbury Center, Vt.

The dispatch from Chattanooga sent out over the Associated Press wires lately, to the effect that a contract had been made by which the United States Government Ordnance Works, of Boston, would be removed to East Chattanooga at once caused considerable speculation as to what was meant. The South Boston Iron Works being the only plant in the vicinity of Boston that have done any casting of ordnance for the Government, it was generally supposed that if there was anything in the dispatch it must be these works that were to be moved. However, Superintendent Hunt states that, so far as the South Boston Works are concerned, there is no truth in the report, for no removal of the works has been proposed or contemplated. As there are no Government ordnance works in the vicinity of Boston, the report is regarded as a fabrication.

The Taunton Locomotive Works have issued a handsomely printed descriptive catalogue of their boiler department. The company have practically abandoned the locomotive business, except so far as repairs and special work are concerned. A considerable amount of locomotive repair work is in hand during the greater part of the time. To take the place of the old business, it has, to begin with, the press business, which is growing rapidly. It is making a special effort to develop foundry and boiler work, and is constantly picking up small pieces of general work. The West End Street Railway Company, of Boston, have just placed with it an order for 30 swivel trucks from a special design which it has furnished and which it hopes may prove very successful. These trucks are to be used under the new, long open cars, which are being built for the summer travel on the electric lines.

The Electrical Safety Company have recently issued a circular offering some of its treasury stock at $5 per share to facilitate the manufacture of instruments, which they sell exclusively through the sub-companies. This company have purchased the exclusive rights for New England, of which C. F. Atherton, late of the Thompson-Houston Company, is secretary and treasurer. Negotiations are pending for other territory.

The present brick machine shop of Smith, Whitcomb & Cook, at Burlington, Vt., was built in 1833, and is now running two large lathes that were placed therein in 1834 and one in 1836. The company are now having a large new lathe, 40-inch swing and 12 feet bed, made for them at Fitchburg, Mass.

The new 50 x 100 foundry building of the Union Foundry Company, now being erected at the foot of South street, Lynn, Mass., will be the finest constructed foundry building in Essex County, especial attention being paid to ventilation and solidity of construction.

Work on the Overman Wheel Company's new building, at Chicopee, will be begun soon, the plans having been completed. They hope to occupy the new structure by September 1.

The Waltham Watch Tool Company have bought a lot of land 100 feet square on the Cowden property, near the Armory Hill station of the New York and New England Railroad, at Springfield, Mass., and will build thereon a factory. The factory will be a wooden building, 90 x 30 feet and two stories in hight, with a brick engine house and boiler house outside the main building.

A factory for the manufacture of electrical insulators is to be erected by the Johns-Pratt Company at Hartford Conn., and a second building has also been begun. The main structure will be a two-story brick building, 140 feet long on Capitol avenue and 40 feet wide. The other building, in the rear of the first, will be of brick, 90 feet long, 40 feet wide and three stories high. There will also be an engine and boiler house. Both buildings will be finished inside with Southern pine, and both will be fitted up with electric lights throughout.

The Housatonic Brass Company, recently burned out in Shelton, Conn., have made temporary arrangement for the manufacture of their goods.

Preparations have been begun by Daniell & Kidder for moving the machine shop and erecting an addition on the north side of Winnipiseogee River, at Franklin Falls, N. H. They will consolidate the Cate, Ryan & Co. shop with the Haynes & Kidder shop.

The Burlington Foundry, at Burlington, Vt., turned out a pair of unusually large castings this week. They are for a water motor at New London, Conn., weigh 4100 pounds each and stand about 5½ feet high.

The Portland Machine Company has changed hands and is now owned by a syndicate of Portland gentlemen, among whom are C R. Milliken, the manager of the rolling mills. The plant represents 2974 shares of capital stock outstanding, its assets above its liabilities being $215,000. It is thought the works will be removed to Ligonia and be established on the land adjoining the rolling mills.

The Page Belting Company, of Concord, N. H., have begun the erection of extensive additional buildings.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. {
PHILADELPHIA, Pa., May 27, 1890. }

Pig Iron.—The general tone of the market shows considerable improvement, but as yet there is no quotable change in prices. Some of the very low priced Irons have been advanced a little, and all descriptions are firmly held at the rates recently ruling. Consumers are comparatively indifferent, however, and in view of the large production, there is no urgency to place orders, and as a matter of fact there is no difference in doing so at from $15.50 to $16, delivered, for Gray Forge; $17 for No. 2 Foundry, and $18 @ $18.50 for No. 1. In some cases even these figures could be shaded, but nevertheless it is unquestionably true that the market is improving, and that concessions available a week or two ago are not to be had to-day. To what extent the market will further improve is not entirely clear, but many leading houses look for a steady movement toward better prices within the next 60 or 90 days. At present, however, the feeling is conservative, neither side being disposed to put out very heavy lines. In the event of cash offers for deliveries during the next couple of months, it is not unlikely that a few good sized lots might be secured in some quarters at prices lower than above named, but for such quantities as are ordinarily called for firm quotations and early deliveries are usually stipulated for. Prospects as regards consumption appear to be encouraging, but the course of the market will depend to a great extent on developments in the West and South. Meanwhile the trade here will maintain its usual conservative position.

Bessemer Iron.—There is more inquiry for this class of Iron, and sellers are not inclined to accept prices named a few days ago. For limited quantities and early deliveries orders might be accepted at about $20 at furnace, but for 5000 tons and upward $20.50 would be an inside figure, as furnaces are under contract for most of their product up to about October 1. Large orders are, therefore, not considered desirable in the present unsettled condition of the market.

Charcoal Iron.—There are sellers at $22@ $24, delivered, for hot blast, and $25 @ $27 for cold blast.

Spiegeleisen.—Not much disposition to buy. There are sellers at $31 for 20 %, duty paid; buyers for 1000-ton lots at about $30.

Ferromanganese.—No demand of any importance; quotations $75 @ $80 for 80 %, duty paid; price according to quantity and date for delivery.

Steel Rails.—The position is not as satisfactory as could be desired, neither is it as favorable as seemed probable some time ago. Mills are running full, however, and the chances for their continuing to do so are reasonably well assured. There are one or two important lots under negotiation, said to be on the basis of $31 @ $31.50, at mill, with $32 for such small lots as are called for from time to time.

Muck Bars.—Prices are unsettled and irregular at $28 @ $28.50 asked for lots delivered at mills near by. Large sales of Muck Bars have taken place at advancing prices, and holders now ask still higher figures.

Steel Billets.—There is a much better feeling in this department, and prices are distinctly dearer than they were a week ago. There have been heavy sales at advancing prices, and holders ask higher prices. There are bids at from $29.50 to $30, delivered, but sellers ask about $30.50 @ $31, and in view of the advance at other points it is not easy to obtain concessions. The outlook is unusually satisfactory, and with the large business in sight a further advance seems to be among the early probabilities.

Bar Iron.—The feeling is a trifle better in sympathy with the improved tone in other departments, but prices are still unsettled and irregular. City mills and others of established reputation quote 1.85¢ @ 1.90¢ for best refined Iron, but Western Iron claimed to be of guaranteed quality, has been offered in 50 ton lots at from 1.75¢ @ 1.80¢ delivered, but without meeting much of a demand. On the whole, however, the outlook is improving, and 1.80¢ @ 1.85¢ fairly represents selling prices for the general run of orders.

Skelp Iron.—Several large orders for Grooved Skelp were taken last week at 1.75¢, delivered, and Sheared Skelp at 1.95¢ @ 2.05¢, but sellers now ask about half a tenth advance, without meeting much demand.

Plates.—A fair amount of business has been entered recently, and mills are becoming very well employed. Low figures have ruled on all orders of any magnitude, but manufacturers are asking more money to-day, and it would be difficult to place an order without yielding something in seller's favor. We repeat last week's quotations which, instead of being more or less nominal, are now pretty near to actual selling prices, viz.: for lots delivered in consumers' yards :

	Iron.	Steel.
Ship Plates	2.05 @ 2.10¢	2.25 @ 2.35¢
Tank	2.10 @ 2.15¢	2.30 @ 2.40¢
Bridge Plate	2.10 @ 2.15¢	2.30 @ 2.40¢
Shell	2.40 @ 2.50¢	2.50 @ 2.60¢
Flange	3.00 @ 3.15¢	2.80 @ 3.00¢
Fire-Box	3.75¢	3.75 @ 4.25¢

Structural Material.—No special movement can be noted in this department, although orders have increased a little during the past couple of weeks. Mills are all moderately supplied with work for some time to come and prospects for additional business quite encouraging. Prices steady and unchanged, as follows: 2.20¢ @ 2.25¢, delivered, for Sheared Plates; 2.15¢ @ 2.20¢ for Angles, with 10¢ @ 15¢ more for the same in Steel. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel

Sheet Iron.—The demand continues good for this season, although there seems an inclination among some buyers to await further developments before placing large orders. No material change in prices. Carload lots quoted as follows:

Best Refined, Nos. 14 to 20	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24	3.20¢ @ 3.30¢
Best Refined, Nos. 25 to 26	3.40¢ @ 3.50¢
Best Refined, No. 27	3.50¢ @ 3.60¢
Best Refined, No. 28	3.60¢ @ 3.70¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¼¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24	3⅝¢ @ 3¾¢
Best Soft Steel, Nos. 25 to 26	3¾¢ @ 3⅞¢
Best Soft Steel, No. 27	4¢ @ 4¼¢
Best Bloom Sheets, 1-10¢ extra over the above prices.	
Best Bloom, Galvanized, discount	60 %
Common, discount	62½ %

Old Rails.—The market is showing a better tone, and it is thought that $24 @ $24.50 would be paid for desirable lots delivered at mills in the interior. There are very few Rails for sale, however, at less than $25 and upward, so that $24 @ $24.50 may be regarded as nominal quotations.

Scrap Iron.—There is a better demand, and sales are easily made at about the following quotations: No. 1 Wrought, $22 @ $23 Philadelphia, or for deliveries at mills in the interior, $22.50 @ $23.50; $16 @ $17 for best Machinery Scrap, $15 @ $15.50 for ordinary, $16.50 @ $17 for Wrought Turnings, $11 @ $11.50 for Cast Borings, and $26 @ $28 for Old Fish Plates, and $18 @ $19 for Old Car Wheels.

Wrought Iron Pipe.—The general demand is excellent, considering the season. There is a slight scarcity reported on Galvanized. Discounts unchanged as follows: Butt-Welded Black, 47½ %; Butt-Welded Galvanized, 40 %; Lap-Welded Galvanized, 47½ %; Lap-Welded Black, 60 %; Boiler Tubes, 1¼ inches and smaller, 45 %; Boiler Tubes, 2 to 4 inches, 50 %; Boiler Tubes, 4½ inches and larger, 52½ %; Oil Well Casing, 50 %.

Louisville.

LOUISVILLE, KY., May 26, 1890.

Pig Iron.—The tone of the market is excellent, with a feeling among buyers that the lowest prices of the year have been reached. There is no question of a healthier feeling in Iron circles, with consumers ready to buy freely to meet all their wants. There has been no marked advance in prices, but none of the furnaces are willing to sell under $10.50 for Gray Forge Birmingham, while the week previous there were slight concessions made on this price. Furnaces will not make sales for long deliveries unless the full market prices can be obtained.

Manufacturers report a large amount of work on hand, and many have orders booked that will keep them running at least two months, and consider the situation entirely satisfactory. The large railroad earnings and increased value of stocks based upon these have lent additional encouragement, and it is felt that the market is in excellent condition. We quote:

Southern Coke, No. 1 Foundry	$14.50 @ $14.75
Southern Coke, No. 2 Foundry	14.00 @ 14.50
Southern Coke, No. 3 Foundry	13.50 @ 14.00
Southern Coke, Gray Forge	13.00 @ 13.50
Southern Coke, Silver Gray	13.00 @ 14.00
Southern Charcoal No.1 Foundry	17.00 @ 18.00
Southern Car Wheel, Standard brands	22.50 @ 23.00

Cleveland.

CLEVELAND, May 26, 1890.

Iron Ore.—The market exhibits more life and activity than for several weeks past, a result naturally following the general improvement in the Iron situation everywhere. Considerable Ore has been sold during the past ten days at the same prices prevailing ever since the market opened. Ore transportation rates are practically unchanged, although a few single trip charters have been made at 85¢, Escanaba to Cleveland. The rate from Marquette is still $1.15, and from Ashland and Two Harbors, $1.25. New Ore is coming down from Lake Superior at a remarkable rate, from 9000 to 18,000 tons per day being the receipts at Cleveland alone, while the total for all Lake Erie ports is not less than 30,000 or 35,000 tons. Ore is also being forwarded to the furnaces in unusual quantities, the shipment for the past week aggregating 29,000 tons.

Pig Iron.—The faces of the furnacemen and dealers tell the story of the change in the general tone of the market and of the outlook for the future without a question being asked. Countenances that were gloomy three or four weeks ago are now cheerful to look upon. The improvement in the market is substantial, and seems to warrant the hopeful feelings entertained. Inquiries have increased and considerable more Iron has actually been sold. All demands anticipating slight concessions or for long future delivery have been peremptorily declined. The revival is not, of course, sufficiently matured to warrant an advance in the quotations, but it is nevertheless true that at existing prices sellers have a clear advantage in the situation and are exercising the same in no uncertain manner. Were any concessions now to be made they would of necessity

come from the buyers and would simply mean better prices. Bessemer Iron is still quoted at $17.50 @ $18.50, and No. 1 Strong Foundry $17.80 @ $18.80.

Scrap Iron.—The market is perhaps slightly more active. Sales of old American Rails at $23 and of No. 1 Wrought at $20 are reported.

Nails.—The market is easy and prices seem continually declining. Quotations have dropped 10¢ per keg; all around Steel Wire Nails now selling for $2.40, Steel Cut Nails for $1.90, and Steel Cut Spikes for $2.15 per keg.

Coke.—There are rumors of an advance, but it is believed that it will be delayed until the improvement in the Pig Iron market warrants such action.

Manufactured Iron.—The market is dull and there is but small demand for Bar Iron even at the present low prices.

Schwarzenberg Bros. & Co. have removed from 105 to 167–187 Scranton avenue, where their yard room will be very much larger.

Col. Fred. H. Flick, for 23 years superintendent of the Cleveland and Pittsburgh Iron Ore Docks of this city, has opened Warehouse 15, South Water street, for the sale of Swedish Iron and Steel, representing Lewander & Co., of Boston, Mass. A specialty is made of H. G. G. Steel, which is well known to the trade.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, May 26, 1890.

Pig Iron.—The past week shows no change worthy of note. Trade is limited to small lots for immediate shipment at full prices, furnaces refusing to countenance concessions on anything but good-sized orders. Production shows no signs of falling off, and unless furnaces are willing to stock up the Iron it is quite probable that it will be offered at lower prices than are at present prevailing. It is opportune to say, however, that furnaces have declared themselves willing to do this rather than accede to the requests of buyers for concessions. If they have the firmness to hold the position taken the future of the market is assured. Fortunately they have a fair supply of orders which will keep them employed for some little time, and as the general outlook for business is encouraging they are disposed to think that with anything like a fair demand the present prices can be sustained if not advanced a trifle. Foundry Irons are in good demand at the following prices, which are for cash, f.o.b. St. Louis: No. 1 Southern Foundry, $15.50 @ $15.75; No. 2, $14.50 @ $14.75; No. 3, $14 @ $14.25; Gray Forge is quoted at $13.50 for round lots. The following quotations are ruling:

Southern Coke, No. 1 Foundry	$15.50 @ $15.75
Southern Coke, No. 2 Foundry	14.50 @ 14.75
Southern Coke, No. 3 Foundry	14.00 @ 14.25
Gray Forge	13.50 @ 13.75
Southern Charcoal, No. 1 Foundry	18.00 @ 18.50
Southern Charcoal, No. 2 Foundry	17.50 @ 18.00
Missouri Charcoal, No. 1 Foundry	18.00 @ 18.50
Missouri Charcoal, No. 2 Foundry	17.25 @ 17.75
Ohio Softeners	18.75 @ 19.50

Connellsville Coke, f.o.b. East St. Louis, $5.65; St. Louis, $5.80.

Bar Iron.—The improvement noted last week continues. Car works are extremely busy and are in the market for further supplies. While prices show no quotable change, there is a gradual firmness perceptible that will eventually lead to higher figures unless something unforseen occurs to depress the market. We quote as follows: Lots from mill, 1.75¢ @ 1.80¢, small lots from store, 1.90¢ @ 2¢.

Barb Wire.—The volume of trade continues large, and during the past week mills have had no reason to complain for want of orders. Prices, however, are weak and unsatisfactory, and the outlook is very discouraging for an early improvement in this respect. Local mills are disposed to advance their prices, but are compelled to meet the figures at which Chicago mills are offering and accepting business. Until these latter are filled up and withdrawn from this market any improvement in prices is out of the question. The following quotations are ruling: Painted 2.85¢ @ 2.95¢. Galvanized, 3.45¢ @ 3.55¢. Carload lots 10¢ per cwt. less than above prices.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, May 28, 1890.

(*By Telegraph.*)

Pig Iron.—Considerable buying of small lots occurred last week, and on the surface prices appear firmer in consequence. Among the trade the opinion prevails that the bottom has been touched, and as soon as consumers realize that they can do no better, the volume of business will be much larger. All buyers are trying to shade prices asked about 50¢ ℔ ton, and want the privilege of deliveries during the remainder of the year. If these concessions were granted numerous negotiations would be immediately closed. Though prices will not go much lower, if any, an advance will not be an immediate result. Nor is it expected that it will be in rapid strides, especially on foundry grades. Charcoal Irons have been held firmer and closer to quotations all through the decline, on account of the short supply, and the same cause may make them the leaders in the upward turn. Northern and Southern Coke Irons are in close competition and both abundant, so that before a material change will occur this surplus stock must be absorbed. Makers of this grade of Iron have about given up the idea that they can obtain a reduction in price of Coke, and realize that unless they do further concessions on Iron would be a net loss on business. The Valley furnace, men claim to be getting better prices and more business since the lowest figures have been cut off. Gray Forge was sold at 50¢ ℔ ton advance on figures prevailing a week ago. Several of the large buyers are making inquiries with a view of placing their orders now, and it is rumored that one order for 4000 tons was closed yesterday. If those consumers who usually get bottom prices commence buying it is pratically an assured fact that buyers of less quantity will not be able to do better. While there is no material change in quotations, the market may be summed up to be stronger and firmer at the following prices:

Lake Superior Charcoal	$20.00 @ $21.00
Local Coke Foundry, No. 1	16.50 @ 17.00
Local Coke Foundry, No. 2	16.00 @ 16.50
Local Coke Foundry, No. 3	15.00 @ 15.50
Bay View Scotch	17.00 @ 18.00
Am. Scotch (Strong Soft), No. 1	19.25 @ 20.00
Jackson County, Soft and Silvery, No. 1	18.00 @ 18.50
Southern Coke, No. 1	16.00 @ 16.50
Southern Coke, No. 2	15.50 @ 16.00
Southern Coke, No. 3	15.00 @ 15.50
Southern Gray Forge	14.25 @ 14.50
Southern Mottled	14.00 @ .....
Tennessee Charcoal, No. 1	20.00 @ 20.50
Alabama Car Wheel	23.00 @ 24.00

Bar Iron.—The market is said to be firm at 1.70¢, half extras. On special orders this price might be shaded, but at the prices asked for old material it is theoretically the bottom. Lots for standard grade car specifications are quoted at 1.65¢ @ 1.70¢, flat. Inquiry for this class of material is very good, there being a number of orders for round lots pending. Jobbers have offered 1.60¢, half extras, on stock orders in lots ranging from 1000 to 2000 tons, which they have been unable to place at that figure. The low-priced mills are evidently pretty well filled up, and the prospects are that better prices will prevail during the month of June. Store quotations remain at 1.90¢ in carload lots for Common Iron, and 2¢ @ 2.10¢ for all Muck Bar with full extras.

Structural Iron.—Since the labor troubles in the building trades have been settled there has been marked improvement in the demand for Structural shapes. The rapid advance in property, based upon future necessities, has brought into the city capital from all sections seeking investment in building enterprises. Nearly every day some new project is brought to the surface, preparations begun for the construction of some mammoth business block, hotel, or manufacturing building, and the prospect for a busy summer trade in this line has not been better for a long time. The capacity of the foundries is well employed at present notwithstanding that in many of the buildings Steel will be exclusively used. In bridge work there is an exceptionally good demand, and plans are rapidly maturing for the establishment of a new plant in this city. Material in carload lots, f.o.b. Chicago, are quoted as follows: Beams, 3.20¢; Angles, 2.25¢; Tees, 2.65¢. From store on small lots 10¢ @ 15¢ ℔ 100 more is charged. Flitch Plates, plain, are 2.45¢ @ 2.55¢ from stock; Punched, 10¢ ℔ 100 more.

Sheet Iron.—The active demand instituted for Sheet Iron several weeks ago continues unabated. The demand for most of the material comes from the extreme West, most of it being subject to shipment at the prevailing low freight rates. In the effort to place orders prices were strengthened, until it was practically impossible to place a large order for No. 27 at less than 3¢, many of the mills refusing to accept orders at this price for deliveries extending beyond July 1. Stocks are light in nearly all gauges and the market is now firmer than it has been for some time past. The new mill put into operation by the Wheeling Iron and Nail Company is the latest acquisition to the trade, and has probably secured some round lots at the above prices. There continues to be a fair demand for Galvanized Sheets, though trade is not active in comparison with the demand for black material. From store jobbers quote 3.30¢ for No. 27 Black Sheet Iron and 62½ % off for Juniata Galvanized.

Plates, Tubes, &c.—In Plate, jobbers are having a good demand in both large and small orders. Mills are rapidly filling up and decline to accept orders from jobbers for delivery in less than two weeks' time. They are now asking from $2 to $3 ℔ ton advance over the prices named over ten days ago, and refuse to quote on stock to be delivered later than July 1. There has also been a good trade in Pipes and Tubes, with considerable encouragement in the way of future business. On Tank Iron carload lots are now quoted at 2.40¢; Tank Steel at 2.60¢; Heavy Iron Sheets, 2.50¢; Heavy Steel Sheets, 2.65¢. Chicago store prices are unchanged in quotation, but are held more firmly to all places of buyers.

Merchant Steel.—There continues to be a steady demand from store in small lots, with a gradual increase in inquiries from large buyers, including the agricultural implement makers. The near approach of the time that the latter place their orders has a tendency to excite more interest in the trade, and under the influ-

ence of larger prospective business prices are reported firmer and more regular. The plow makers are also making inquiries for future stocks, and taking the market as a whole, the general condition is an improvement. From store jobbers quote Open Hearth Steel, 2.75¢ @ 2.85¢; Machinery, 2.65¢ @ 2.75¢; Tool Steel, 7¢ @ 9¢; Specials, 13¢.

Steel Rails, Fastenings, &c.—The Western market is reported firm at $35 per ton for the common run of orders. The weakness in the East has not, so far as known, effected this market, but in competition with Eastern makers, on lots that could be handled to advantage, concessions might be made. The capacity of the local mills is well employed until October, though small lots can be accepted for delivery at various periods before that time. Iron Splice Bars are quoted at 1.90¢, and Steel at 2.15¢; Hexagon Nut Track Bolts 2.85¢ @ 2.95¢.

Old Rails and Wheels.—There has been a fair demand for Old Iron Rails, at prices ranging from $22.50 @ $23. No transactions of consequence are reported, as those who have the stock on hand refuse to accept prices named. It is said that there are quantities ranging from 1000 to 3000 tons in the hands of nearly all the railroads in the West, which they are withholding from the market. The available stock is therefore scarce, and it cannot be definitely determined how much advance will be necessary to bring out the unknown supply. Old Steel Rails in long lengths are in good demand and quoted at $20.50 @ $21. Short pieces are in better supply and could be had at $18 @ $18.50. Old Wheels are nominally $19 @ $19.50, with small sales at the outside figure, and negotiations pending for larger lots at the inside price.

Scrap Iron.—There is some increased activity in the demand for Scrap of the better grades. Consumers claim that they cannot pay prices asked, and dealers claim that the scarcity of material makes it unreasonable to expect lower prices. Quotations are as follows: No. 1 Railroad Wrought, $18.50; No. 1 Forge, $18; Pipes and Flues, $13.50; No. 1 Mill, $14; No. 2 Mill, $10; Fish Plates, $21; Axles, $24; Machinery, Cast, $13.50; Cast Borings, $8 @ $8.50; Wrought Turnings, $12; Axle Turnings, $13: Stove Plate, $10.50; Mixed Steel, $14; Coil Steel, $17.50; Leaf Steel, $18; Tires, $19.50; Horseshoes, $18.50.

Pig Lead.—The recent action of the House on the importation of foreign Lead Ores has revived interest in the market. Prices were stronger, and business is more active. Sales of about 700 tons, desilverized, were made at prices ranging from 4.15¢ to 4.25¢. At the close of the week the market was easier, 4.15¢ bid and 4.20 asked. Stock in the hands of consumers is reported light, while that in the warehouses is being rapidly reduced. Refiners are said to be well sold up and consumption increasing.

Detroit.

WILLIAM F. JARVIS & Co., under date of May 26, 1890, say: The large inquiry for Lake Superior Charcoal Iron continues, and a number of transactions were closed during the past week at ruling figures. These, however, consisted of the smaller inquiries, but amounted in the aggregate to a tonnage of perhaps 2000, and was distributed among several buyers. The large consumers seem ready to buy at almost any time, but keep postponing closing their deals with a view of further concessions being granted. It is very improbable that any lower figures will be made, however, than exist at the present time. The month of June must be the most active of the year for this grade of metal, and while stocks in the hands of furnacemen have increased somewhat, they have not done so to any great extent, nor is there any large surplus in the hands of owners to-day, while, on the other hand, there are very small stocks pig iron in consumers' hands. Business with nearly every malleable man in the country is very active, and the Car Wheel men are as full of work as it is possible for them to be. There were a few transactions of small volume for Foundry Iron at ruling prices. Inquiry for Bessemer developed the fact that the reaction has already been felt for this grade of metal, and that prices are on a higher plane. We repeat quotations of a week past, as follows:

Lake Superior Charcoal, all numbers	$21.00 @ $21.50
Lake Superior Coke, Bessemer	18 00 @ 19.00
Katahdin (Maine Charcoal)	24.50 @ 25.00
Lake Superior Coke Foundry, all ore	18.75 @ 19.25
Standard Ohio Blackband	18.75 @ 19.25
Southern No. 1	16.50 @ 17.00
Southern Gray Forge	14.75 @ 15.25
Jackson County (Ohio) Silvery	18.75 @ 19.25

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, May 27, 1890.

Pig Iron.—We have to report a continued active market, with more buyers than sellers at prices of a week ago; consumers generally are anxious to contract, especially for future delivery, while furnacemen do not care to sell beyond the next month or two. Since last report an advance of 25¢ @ 50¢ ℔ ton on Forge and Bessemer Irons may be reported. Foundry grades for which there does not appear so much inquiry, have failed as yet to respond to the advance in the former, but will no doubt as soon as there is a demand for it. Sales of 10,000 to 12,000 tons of Forge Iron have been reported during the past week, at $15 @ $15.25 cash, mostly $15; several thousand tons of Bessemer also reported for delivery during June and July at $17.75 @ $18, mostly at the latter price. One reliable broker reports having sold Bessemer for a Valley furnace for July at equal to $18.50 cash. Pittsburgh and many of the Valley furnacemen are asking from $18 at furnace, equal to $18.90 Pittsburgh. We quote as follows:

Gray Forge	$15.00 @	$15.50,	cash.
All Ore Mill	16.00 @	16.50,	"
No. 1 Foundry	17.50 @	18.00,	"
No. 2 Foundry	16.25 @	16.75,	"
Bessemer Iron	18.00 @	18.50,	"

It is difficult to give accurate quotations in the present condition of the market.

Muck Bar.—There is an increasing demand and the market is firmer; prices during the week have advanced. Sales of 2000 tons reported, mostly for nearby delivery, at $27.50 @ $28, cash. It is doubtful if contracts could now be made for forward delivery at prices quoted.

Manganese.—Small sales of Domestic, 80 per cent. Ferro, for immediate or nearby delivery, at $84 @ $85.

Manufactured Iron.—While prices remain unchanged, there is a firmer and better feeling, and a considerably improved demand is looked for before the season becomes much more advanced. Bars, 1.75¢ @ 1.85¢, as to quality, delivery, character of order, &c. Plate and Tank Iron, 2.10¢ @ 2.15¢; No. 24 Sheet, 2.80¢ @ 2.90¢; Skelp, 1.75¢ @ 1.80¢ for Grooved, and 2¢ @ 2.05¢ for Sheared.

Structural Iron.—Manufacturers continue to report an increasing demand, but prices remain unchanged, as follows: Angles, 2.25¢; Beams and Channels, 3.10¢; Sheared Steel Bridge Plates, 2.75¢; Universal Mill Plates, 2.40¢; Refined Bars, 1.90¢ @ 2¢.

Steel Plates.—There is a fair degree of activity and prices are firmer but unchanged. Fire-Box, 4¼¢ @ 4¼¢; Shell, 3¢; Flange, 3.15¢ @ 3.20¢; Tank, 2.75¢.

Merchant Steel.—No change in prices. Demand fair. Tool Steel, 8¢ and upward; Crucible Spring Steel, 4¢; Open Hearth Steel, base sizes, 2¼¢; Bessemer Machinery Steel, 2.35¢; Tire Steel, 2.50¢ @ 2.60¢.

Billets and Slabs.—Bessemer Steel Billets and Slabs continue to advance and we now quote at $28.50 to $29. There was a sale of Billets made here at $29.50, delivered in Mahoning Valley, which was equal to $28.55, Pittsburgh. Some manufacturers are now refusing to sell below $29.

Nails.—Manufacturers here still quote Cut Nails at $1.90, 60 days, 2 per cent. off for cash, but they are not selling many. Wheeling, up until the past few days, has been selling at $1.65 there, and one of our Pittsburgh manufacturing firms is reported as having bought 5000 kegs there for this market, being able to sell them here, after paying freight, to better advantage than his own product. Wire Nails are still quoted at $2.20 @ $2.35, 60 days, 2 per cent. for cash.

Wire Rods are reported firmer and quoted at $41.50 @ $42. An increased inquiry is reported.

Wrought Iron Pipe.—An adjourned meeting of the pipe association took place in this city on Thursday last. Of the 21 mills in the association, 20 were represented. The meeting is reported as having been a most satisfactory one. No change whatever made in prices as last reported. All Pipe above 4-Inch is 52½ % off, and not 4-Inch and over, as reported in our last.

Old Rails.—There has been considerable inquiry during the past week for Old Iron Rails, mostly from consumers in the Mahoning and Shenango Valleys, and prices as compared with those of a week ago are higher; we now quote at $24.50 @ $25. Old Steel Rails are quoted at $20 @ $21 for short and $22 @ $22.50 for long pieces.

Railway Track Supplies.—Spikes are still quoted at 2.05¢, 30 days here, and 2.15¢ delivered at Chicago, and St. Louis Splice Bars and Track Bolts remain unchanged.

Steel Rails—The market here is firmer in sympathy with Bessemer Pig. So far as we can learn there have been no sales here below $31 cash, and it is doubtful if an order could now be placed here at this price. Indeed, we hear of an order having been refused at $32.

Old Material.—There is a fair inquiry and the market is firmer, but prices remain unchanged.

(By Telegraph.)

Pig Iron continues to show increased firmness, although as yet there is an absence of any particular excitement; but furnacemen generally are inclined to hold back, while consumers are more anxious to buy. No speculation has developed as yet, and there is a strong feeling to discourage it. No. 1 Forge Iron is quotable at $15.25 @ $15.50, cash, for near-by delivery: Bessemer has been sold for July at $18, cash, at Valley furnace, equal to $18.90; Pittsburgh Muck Bar is stiff at $28, cash, for good strong Neutral; Bessemer Steel Billets show more strength than anything else, and to-day are quotable at $29 @ $30; Old Iron Rails are scarce, with considerable inquiry, and sellers quote at $24.50 @ $25. There is a much better feeling in all lines of the Iron and Steel business.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, May 26, 1890.

Pig Iron.—Both producers and consumers are looking forward to an advance in prices; increased inquiries and sales are now the order of the day. There is very little Iron in store at any of the furnaces, and all lots of Iron that are offered at a small concession are readily taken either by consumers or speculators. The furnaces, at least most of them, are sold ahead so far as the near future is concerned and decline long-time future delivery contracts, excepting at some considerable advance at present prices. A much more hopeful feeling has prevailed during the past month or so. An offer of $11, spot cash, for 1000 tons No. 3 was promptly declined on Wednesday last by one of the most prominent makers, and $11.75, net, at furnace, was asked. No. 1 Foundry is going at $12 50, when it can be found, as many of the furnaces do not care to sell at that figure, excepting for quick shipment, and nearly all of their capacity is already placed for such shipments. The construction of new plants for the production of Pig Iron is going on rapidly; locations are being made all over the country and are apparently backed with an abundance of capital. Of course many of them will never materialize, but enough of them will be completed of those that are now started, to say nothing of those that are yet to come, to materially increase the amount of Pig Iron produced in the South.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, May 28, 1890.

(*By Telegraph.*)

Pig Iron.—Buyers of Iron have not only been willing but anxious to obtain both large and small amounts of Iron for long delivery, especially for the latter half of the year, at prices now current, but furnaces, as a rule, either refuse outright to make such contracts or will sell only at an advance of 50¢ ₱ ton on previously quoted prices. For prompt delivery, however, a number of Southern producers have continued to meet the demand on the basis established a month or so ago, and several sales are credited upon even a lower level. The local market has been less prolific in large transactions, and even small buyers have contributed a smaller amount of orders to the volume of trade. The aggregate, however, is of very satisfactory proportions. The bearish sentiments entertained for so long, having birth in the heavy productions especially in the South, are being somewhat modified by the development of counter movements in the North, demonstrated by the improvement in Bessemer Iron and Steel. Lake Ore, too, has advanced some, giving tone to the market for its resultant Iron. Pittsburgh is credited with being the center of the stronger feeling which is growing, being fortified by the increased activity in general business in the oil and mineral sections of Ohio, in real estate and in speculative ventures as well, in which money is finding more active and more profitable employment. It is believed, however, that prosperity and higher prices for Pig Iron can only follow the exercise of a more conservative policy in the output of Iron in the South and the elimination of disturbing factors which make realizations necessary at inopportune times. The Central Traffic Association, at their recent meeting in Chicago, refused to grant relief to Ohio furnaces by a reduction of west bound freight rates. Among the larger sales of Iron reported here during the week are 3000 tons Gray Forge and Silvery Iron on the basis of $10.25 @ $11.25, cash, at furnace, respectively; 1000 tons Gray Forge at basis of $10.50, cash, at furnace, all prompt delivery. Amounts aggregating 5000 to 6000 tons of Forge and Foundry grades are on the market for long delivery, but are held in abeyance by furnace. Car Wheel Iron has shown unexpected weakness, with sales of 2000 tons on basis of $19, cash, at furnace, and is reported even to be obtainable at $18, cash, for prompt shipment. Quotations:

Foundry.	
Southern Coke, No. 1	$14.75 @ $15.00
Southern Coke, No. 2	14.25 @ 14.50
Southern Coke, No. 3	13.50 @ 14.00
Ohio Soft Stone Coal, No. 1	16.50 @ 17.00
Ohio Soft Stone Coal, No. 2	15.50 @ 16.00
Mahoning and Shenango Valley	16.50 @ 17.00
Hanging Rock Charcoal, No. 1	20.00 @ 21.00
Hanging Rock Charcoal, No. 2	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1	17.20 @ 18.50
Tennessee and Alabama Charcoal, No. 2	18.00 @ 18.50
Forge.	
Gray Forge	13.25 @ 13.50
Mottled Neutral Coke	12.75 @ 13.00
Car Wheel and Malleable Irons.	
Southern Car Wheel	22.50 @ 23.25
Hanging Rock, Cold Blast	21.50 @ 24.25
Lake Superior Car Wheel and Malleable	20.00 @ 21.00

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, May 28, 1890.

The sudden change for the better in Pittsburgh in Bessemer Pig, Billets and Wire Rods has not been without its effect upon the Eastern markets. It has relieved them of a strain under which they had been suffering. The low prices made were dictated by Pittsburgh and Wheeling, adding freight. The Eastern markets maintained a level higher by the cost of delivering from Pittsburgh to common points. The rise there allows the Eastern works to control their own market once more. The scare is over and a more confident feeling prevails.

American Pig.—The market in this vicinity remains quiet, the volume of business being moderate. The supply of Foundry Irons which this market is almost exclusively interested in continues ample, except No. 1, of which grade the Alabama furnaces have relatively little to offer. We continue to quote $18 @ 19 for No. 1 and $17 @ $18 for No. 2 Northern, and $16.75 @ $17.25 for No. 1 and $16 @ 16.50 for No. 2 Southern Foundry Iron.

Spiegeleisen and Ferromanganese.—The change in feeling in the West is illustrated in a recent occurrence. A Steel works, through an importer, offered for resale a lot of 1000 tons of Spiegeleisen to arrive as low as $33, Pittsburgh. A counter offer of $32 was made and declined. Now the seller has withdrawn even at the figure first named. There has been more active inquiry for Ferromanganese, some of the Western Steel mills being in the market for the third quarter of the year. Sellers quote from $75 to $80 for 80 %. For immediate delivery $83 has been paid.

Billets.—Transactions of some magnitude have been made, but details are withheld. Some sellers ask $30 at mill. Nail Slabs were until a few days since offered as low as $29 at buyers' mill.

Wire Rods.—No business is reported. One Pittsburgh mill which sold as low as $38 about two weeks since is now asking $41.

Steel Rails.—The market is very quiet and dull, with comparatively few orders in sight for the Eastern mills. Pittsburgh makers are reported to be stiffer. Up to May 1 the sales reported were 1,020,023 gross tons, but what is more important, the deliveries to that date aggregated 464,211 tons by the reporting mills. It is not estimating too high to place the total Rail deliveries, including Light Rails, at close upon 550,000 tons. This is at the rate of 825,000 tons for the first half of the year, while last year the output of the first six months was only 642,653 tons, while it was 827,792 tons during the second half. In other words, in spite of the feeling so prevalent that the Rail trade has been relatively slow, the tonnage is equal to that of the second half of last year and far in advance of that of the first half of 1889.

We continue to quote the market nominally $31 @ $31.50.

Structural Material.—There is a little beter feeling. We quote: 2.15¢ @ 2.20¢ for Plates, 2.15¢ @ 2.25¢ for Angles, 2.5¢ @ 2.6¢ for Tees and 3.1¢ for Beams and Channels.

Fastenings.—We quote Spikes $1.90 @ $2, Angle Bars 1.75¢ @ 1.80¢ and Bolts and Nuts 2.80¢ @ 3¢.

Old Rails.—Western inquiries continue to be the feature. There is also some demand from Southern mills. We note a sale of 500 tons at Jersey City at $23. We quote $23 @ $23.50.

Financial.

A review of the week presents several interesting features, but none of controlling importance. The general outlook is more quiet, owing to reaction in speculative circles. For the same reason money is less active. Cotton has advanced to a point higher than for a long time, with a probability of corresponding changes in certain lines of manufactured goods. There is no longer any special anxiety respecting the dry goods trade and slow collections, the market being well sold up. In the various industries there is a much more settled feeling. The crop outlook is better. As respects railway questions favorable results are expected from the conference of Chairman Walker, of the Interstate Railway Association, with prominent managers now in this city. The trunk line tonnage continues large for the season.

On the Stock Exchange it is remarked that Wall street is taking a rest after the excitement caused by the Atchison and Richmond Terminal deals. The expansion of capital in these cases will be attended by a nearly corresponding diminution of the number of the shares in the hands of the public. The liveliest interest centers in Chicago Gas Trust and Oregon and Transcontinental. The management of the last named has indicated the terms upon which the stockholders will be allowed to participate in its reorganization. At the close prices were generally firm despite the general falling off in business excepting Sugar Trust, which was weak on the withdrawal of orders. Other Trust properties were somewhat affected Whisky Trust was strong on the advance in the price of spirits, but reacted on the latest information. Some of the exchanges will close until Monday morning on account of Decoration Day.

Government bonds are quoted as follows:

U. S. 4½s, 1891, registered	103¾
U. S. 4½s, 1891, coupon	103¾
U. S. 4s, 1907, registered	122
U. S. 4s, 1907, coupon	122
U. S. currency 6s, 1895	116

In State securities $2000 Arkansas 7s, Memphis and Little Rock issue, sold at 5½; $15,000 South Carolina non-fundable 6s at 4½ @ 4½, and $10,000 North Carolina, special tax issue, at 5½. Bank stocks were neglected.

The bank return for the week shows an increase of $1,458,425 in surplus reserve, which now stands at $3,471,300. The loans show a loss of $879,900; the specie is up $349,000; the legal tenders increased $1,061,600; deposits other than United States are down $191,300. The loan mar-

ket at times was stringent, but at the close was more favorable to borrowers. For time loans rates continued firm on a basis of 5 @ 5½ per cent. on choice collateral. The return of money from the interior is slow. Commercial paper quiet. The best double-name paper is quoted at 5½ @ 6 per cent., and prime single name at 6 @ 7 per cent. In Chicago money is firm at 6 per cent., but there is supposed to be no warrant for uneasiness. Foreign exchange was fairly active and strong. The posted rates for sterling were advanced to $4.84½ @ $4.86½.

The foreign commerce of the United States, owing to the large gain in imports at New York, and corresponding decline in exports in April, affords a less favorable exhibit than might be desired. The imports at all the ports was $73,947,311, and the exports $67,206,721, leaving a balance against this country of $6,740,590 for the single month. The total exports for ten months ending April 30 were $792,968,792; total imports, $672,537,086. Thus it appears that in spite of the unfavorable showing for the last month the totals from the beginning of the fiscal year are quite encouraging. The exports exceeded the imports by over $120,000,000, against $60,000,000 for the corresponding ten months of the previous year. The proportion at this port was 66 per cent. of the imports and 46¼ per cent. of the exports.

The merchandise markets are less active. Breadstuffs are weak and irregular. In wheat there is an absence of export business and general weakness on good crop reports from all parts of the Northwest, spring wheat having derived most benefit from copious rains. A break in the Erie Canal causing serious interruption of traffic had little effect. Reports concerning corn are not so favorable. Oats declined on full receipts. Coffee is quiet, tending lower. Spot cotton is up nearly half a cent per lb. India rubber steady; fine Pasa quoted 8¢. Petroleum steady. Provisions are weak and dull on larger supplies and realizing by packers. Sugars are strong and sellers indifferent. Among dry goods jobbers the demand is moderating. A continued advance in cotton points to higher prices. Woolens are supposed to have touched the lowest figures.

The system of "kiting" in vogue among certain Wall street banks, otherwise the interchange of checks without any corresponding amounts on deposit, received a severe rebuke in the conviction of Pell of bank-wrecking fame, in the Court of General Sessions, who will spend a term of years in prison.

The New York Co-operative Bank has been incorporated with a capital of $50,000,000. It is announced as a building and loan association, with Charles B. Wisner president.

The United States National Bank will soon take possession of its elegant building, Nos. 41 and 43 Wall street. The offices are finished in onyx and gilt.

The New York Supreme Court granted the Western National Bank an attachment against the property of Perez-Triana & Co., in a suit brought to recover $196,000, money advanced upon promissory notes. Perez-Triana, the only resident partner, is believed to have returned to Bogota, U. S. C.

The reported embarrassment of Smith, Wade & Co., of Quebec, is not likely to cause any serious trouble in the lumber trade, as their assets are largely in excess of their liabilities.

The amended schedules of Geo. K. Sistare's Sons, bankers and brokers, were filed yesterday. They show actual liabilities, $311,707; contingent liabilities, $1,345,900; nominal assets, $1,765,036; actual assets, $40,124.

Metal Market.

Copper.—Lake Superior product is ¼¢ higher on actual sale. Over 1,000,000 pounds have been disposed of for prompt and near future delivery at up to 15½¢, and a considerable quantity at up to 15¾¢ for June, July and August delivery. The latter transactions included Ingots, Cakes and Wire Bars. Those at 15½¢ and under were chiefly, if indeed not wholly Ingots. There is yet a good demand at the figures quoted—namely, 15½¢, prompt, and 15¾¢, future delivery. Sellers, however, are now asking 15¾¢ and 15¾¢ respectively, with utmost confidence in securing those figures before long. The consumptive demand is represented as being phenomenal, and absorbing the product of the mines so closely, that the mining companies or other holders will consider offers at the last prices quoted where deliveries further ahead than August are asked for. Quite a large block of Arizona Ingot has been disposed of at 13.90¢ @ 13.95¢, and 14¢ is now a strictly inside price for that class of material. Common casting brands were sold at 13.35¢ @ 13.40¢ during the week, but at the close 13½¢ seemed to be the lowest at which any could be secured. Our private cables state that French holders are still realizing in the foreign markets, but prices there continue to advance, and Merchant Bars are up to £54. 5/ @ £54. 10/ in London.

Tin.—Speculation in Pig Tin has been quieter, although there is yet a diversity of opinion and an element of uncertainty in the surroundings that ordinarily prompt the speculator to action. Some authorities figure it out that consumption thus far this year falls several hundred tons below that of the first five months of 1889. Others maintain that as much metal has been consumed this year as last. There seems also to be a margin of 200 to 300 tons between different estimates of the supply on spot and afloat, and considerable variety in reports as to probable shipments from primary points during the next sixty days. During the week cash sales have been made at 20¾¢ for prompt, and 20.80¢ for May delivery, but dealings the last few days showed a recovery to 21¼¢, with more buyers than sellers on the reaction. Tuesday's net cash prices for 10-ton lots were 21.15¢ bid, 21¼¢ asked, spot; 21.15¢ @ 21.20¢, May delivery, 21.15 @ 21.20¢ June and 20.10¢ @ 21.20¢ July. Store prices were 21.35¢ @ 21¼¢, according to size of lot.

Lead.—Dealings have been smaller and local speculative interest tamer than it was a week ago, although Western reports still note considerable buoyancy and very firm markets. Small quantities have been dealt out from store here at 4¼¢, 30 days, and carload lots were at one time offered at as low as 4.17½¢ by holders of stock purchased some time ago at 4¢ and less, while 400 tons were said to have been sold at 4.15¢. Tuesday, however, there were buyers at 4.30¢ for round lots, while offerings were limited, with little stock at less than 4.35¢ @ 4.40¢. Consumers' purchases are still unimportant, and bids from that quarter reflect no anxiety as to supplies for immediate or future delivery.

Spelter.—Prime Western is now quoted at 5.40¢ and upward, and common can be purchased at little if anything under 5¼¢. There has been no unusual movement or demand from any quarter The strength of the market, in fact, is due chiefly to position of supplies in the West and alleged scarcity of Ores.

Antimony.—The routine business is passing and demand is merely fair. Hallett's is quoted at 19¢ @ 19½¢ and Cookson's at 25¢ @ 26¢ on the spot.

Tin Plate.—There has been little change the past week, as far as operations are concerned. Purchases of future deliveries have scarcely equaled those of the preceding week, although of considerable value, but the aggregate of transactions in spots and futures makes nearly as large a total. At present the demand is running somewhat uneven. Prices are rather higher on Cokes from store, but otherwise without noteworthy change. Quotations for large lines, on the spot, are as follows: Coke Tins—Penlan grade, IC, 14 x 20, $4.40; J. B. grade, do., $4.45; Siemens Steel, $4.65; Bessemer do., $4.42½. Stamping Plates — Bessemer Steel, Coke finish, IC basis, $4.70; IX basis, $5.70; Siemens Steel, IC basis, $4.80; IX basis, $5.80. IC Charcoals—Calland grade, ½X, $5.70; Melyn grade, $5.80 @ $5.85, for each additional X add $1.50; Allaway grade, $4.90 @ $5; Grange grade, $5.10 @ $5.15, for each additional X add $1. Charcoal Ternes — Worcester, 14 x 20, (scarce); 20 x 28, $9.60; M. F., 14 x 20, $6.87½; do., 20 x 28, $13.75; Dean, 14 x 20, $4.55; do., 20 x 28, $9.10; D. R. D., grade 14 x 20, $4.45; do., 20 x 28, $8.90 @ $9; Mansel, 14 x 20, $4.50; do., 20 x 28, $9; Alyn, 14 x 20, $4.55; do., 20 x 28, $9.00; Dyffryn, 14 x 20, $4.65; do., 20 x 28, $9.20; Wasters—S. T. P. grade, 14 x 20, $4.20; do., 20 x 28, $8.65; Abercarne grade, 14 x 20, $4.20; do., 20 x 28, $8.60.

New York Metal Exchange.

The following sales are reported:

WEDNESDAY, May 21.

100 tons Lead, June..... 4.35¢
200 tons Lead, July..... 4.35¢
100 tons Lead, June..... 4.30¢
100 tons Lead, July..... 4.30¢
25 tons Tin, July..... 20.90¢
100 tons Lead, May..... 4.30¢
100 tons Lead, May..... 4.35¢
10 tons Tin, spot..... 21.00¢

THURSDAY, May 22.

200 tons Lead, June..... 4.30¢
15 tons Lead, May..... 4.32½¢

FRIDAY, May 23.

200 tons Lead, June..... 4.30¢
20 tons Tin, spot..... 20.85¢
10 tons Tin, May..... 20.80¢
60 tons Tin, June..... 20.90¢

MONDAY, May 26.

10 tons Tin, June..... 20.95¢

TUESDAY, May 27.

10 tons Tin, July..... 21.10¢
10 tons Tin, July..... 21.15¢

Coal Market.

An important meeting of producers and sales agents was held on Tuesday afternoon, at the office of the Pennsylvania Coal Company, and circular prices for June were agreed upon as follows:

Broken	$3.50	Stove	$3.90
Egg	3.65	Chestnut	3.65

which is an advance of 15 cents per ton, and action is said to have been harmonious. The production for June is fixed at 2,750,000 tons. As stated last week, Reading led in the advance, and it was intimated that the movement might become general.

The Anthracite Coal trade is experiencing the quietness usual with the approach of the summer months. There is no approach to activity, excepting in the sizes consumed by manufacturers. Several more collieries have resumed, which will not help to relieve the phlethora, already a subject of complaint. The official statement of production is as follows for the week ending May 17, compared with the same period last year:

Regions.	1890. Tons.	1889. Tons.
Wyoming region	387,588	358,148
Lehigh region	136,322	125,967
Schuylkill region	193,187	197,331
Total	717,097	679,446
From Jan. 1	10,598,597	10,837,913

The companies are producing considerably more than they were a year ago, and are also exceeding the allottment of 2,500,000 tons for the month of May. The Pennsylvania tonnage for the week was 232,863 tons of coal and 97,808 tons coke. Total tonnage this year to date 6,700,712 tons coal and coke. The Reading tonnage for the past week was 120,000 tons.

The Bituminous trade is active in filling orders under recent contracts. Cumberland shipments for the week were 78,700 tons.

Imports.

Hardware, Machinery, &c.

Boker, Hermann & Co., Iron Chains, cks., 22
Mdse., cs., 7; Hdw., cs., 34
Downing, R. F. & Co., Mach'y, pgs., 5
Foley, E., Mach'y, cs., 6
Field, Alfred & Co., Mdse., cs., 18
Folsom, H. & D. Arms Co., Arms, cs., 9
French, Edye & Co., Mach'y., pgs., 25
Graef Cutlery Company, Cutlery, cs., 7
Hartley & Graham, Arms, cs., 149
Havemeyers & Elder, Filter Presses, cs., 50
Herzel, Feltmann & Co., Mach'y, cs., 3
Johnson, J. & Co., Mach'y., pkg., 1
Meacham Arms Co., Arms, cs., 23
Merchants' Despatch Co., Arms, cs., 68
Riesthal, A. de & Co., Nails, cs., 40
Sheldon, G. W. & Co., Guns, cs., 13
Schoverling, Daly & Gales, Arms, cs., 11
Stoddard, Lovering & Co., Mach'y, cs., 14
Tryon, E. K., Arms, cs., 11
Vom Cleff & Co., Chains, 1; ditto, cks., 18
Wyman, C. & Co., Arms, cs., 37
Wiebusch & Hilger, Arms., cs., 9; Mdse., cs., 11
Witte, John G. & Bro., Cutlery, cs., 5

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, May 28, 1890.

There have been no important developments in the speculative branch of the Iron trade; practically no market in Scotland since Wednesday. There is further talk of furnaces going out, but those reports have little effect except to cause buyers of Cleveland to hold back. Scotch warrants eased off Tuesday to 44/7, and Cleveland to 40/6. Hematites sold at 53/3 @ 53/6. Makers' prices for most brands of Scotch Pig are rather steadier, as are also those for Hematite Pig, but Cleveland is selling at a further slight decline. Spiegeleisen prices have firmed up in response to rather better demand. Steel, except in the form of Rails, is in no better demand, and prices are still unsettled. A further decline of 2/6 is quoted on Wire Rods.

Tin Plate has had rather better demand and prices are stiffer. Buyers seem more inclined to take hold at sellers' late figures and inquiries have been made for large lots. On actual sales there is 3d. advance over last week's prices all along the line.

Block Tin is taken for consumption in fair quantities, but speculation is moderate at present. Prices weakened somewhat, owing to lack of outside interest, but have since recovered.

In Copper there has been a large business, and prices are again higher all along the line, with £1 5/ advance on bars. French holders have realized, but in a careful manner, and without detrimental bearing upon the market.

Bessemer Pig.—Business still slow and prices barely steady. West Coast brands, Nos. 1, 2 and 3 at 57/, f.o.b. shipping port.

Scotch Pig Iron.—The demand for makers' brands continues moderate, but prices are rather steadier:

No. 1 Coltness,	f.o.b. Glasgow		65/6
No. 1 Summerlee,	"	"	64/6
No. 1 Gartsherrie,	"	"	62/
No. 1 Langloan,	"	"	65/
No. 1 Carnbroe,	"	"	46/6
No. 1 Shotts,	"	at Leith	65/
No. 1 Glengarnock,	"	Ardrossan	64/6
No. 1 Dalmellington,	"	"	53/
No. 1 Eglinton,	"	"	47/

Steamer freights, Glasgow to New York, 2/, nominal: Liverpool to New York, 10/.

Cleveland Pig.—The market very quiet and prices still weak. Makers quote 41/ @ 41/3 for No. 3 Middlesborough, f.o.b.

Spiegeleisen.—Demand rather more active and prices firm: English 20 % quoted at 97/6, f.o.b shipping port.

Steel Rails.—There is still a good demand. Prices steady and unchanged. Heavy sections quoted at £5, and light sections £5. 10/ @ £6. 5/, f.o.b. at N. W. England shipping point.

Steel Blooms.—No improvement in demand. We quote £4. 17/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Business still moderate and prices as quoted are only nominal. Bessemer 2½ x 2½ inch, £5. 2/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—A very quiet market. Prices wholly nominal. Bessemer quoted at £5. 7/6, f.o.b. at N. W. England shipping point.

Old Rails.—Dull market and prices without change. Tees quoted at £3 @ £3. 2/6, and Double Heads £3. 5/ @ £3. 7/6, f.o.b.

Scrap Iron.—Sales small and the demand no better. Heavy Wrought quoted £2. 15/ @ £2. 17/6, f.o.b.

Crop Ends.—Little business passing. Demand slow. Bessemer quoted £2. 17/6 @ £3, f.o.b.

Tin Plate.—The demand continues fairly active and prices are firm. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	15/9 @ ....
IC Bessemer Steel, Coke finish	14/ @ 14/3
IC Siemens " " "	14/3 @ 14/6
IC Coke, B. V. grade	13/9 @ ....
Charcoal Terne, Dean grade	14/ @ ....

Manufactured Iron.—There is no particular change. Trade quiet and at previous prices. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars				@	9	10	0
" Common "				@	7	10	0
Staff. Bl'k Sheet, singles				@	9	0	0
Welsh Bars (f.o.b. Wales)				@	6	15	0

Tin.—The market very firm to-day and demand good. Straits quoted at £95, spot, and £95. 10/ for three months' futures.

Copper.—Prices show £2 advance for the week and market now very firm. Chili Bars quoted at £54. 15/, spot, and £52. 5/, three months' futures; Best selected, £60. 10/ @ £61.

Lead.—A fair demand and prices steady. Quoted at £13 for Soft Spanish.

Spelter.—Very little change in prices during the week. Demand is fair. Quoted at £23 @ £23. 5/ for Ordinary Silesian.

The Springfield Steel Casting Company, of Springfield, Ohio, have their plant nearly completed, and will be ready to make castings by June 10. The members of the firm are J. W. Maxwell, recently engineer and superintendent of the Whitely Steel Company, and G. H. Vincett, formerly with Sweet's Mfg. Company, of Syracuse, N. Y. The crucible process will be used, and by the method adopted by them as the result of extensive experiments, castings of any desired temper from very soft to very hard can be produced, and as very slight annealing is required, prompt shipments can be made.

The Bargion rail, which the Southern Pacific Company will experiment with, is the invention of an Oakland mechanic. It is in two sections. The upper part or rail proper has a wedge flange which sets in a matrice groove in the lower part or bed. Both are united firmly by bolt catches. In a channel at the foot of the wedge terminal will be inserted a cable or bundle of telegraph wires. A perfect insulation is thereby affected and the pole system of stringing wires will be obviated. Telegraphic communication between stations and gliding trains can be maintained easily. It is claimed that this new fangled rail will afford better traction and that it is superior generally.

The lumber going to Eastern points from Lakes Michigan and Superior will this season amount to 200,000,000 feet, an increase over last year's shipments eastward of 40 per cent. The increase will be made largely at Green Bay ports, Muskegon, Ludington and Manistee. Seven-eighths of these shipments are to Tonawanda, and there distributed by the Erie Canal to New York State points.

By a misinterpretation of their report we were led to state in the review of the status of the blast furnaces, on May 1, that the La Grange furnace, of the Southern Iron Company, was temporarily running on coke. They have not used and have not considered the use of coke as fuel for La Grange furnaces.

Pittsburgh manufacturers are crowded just at present with orders for pipe. Carnegie, Phipps & Co. recently placed a contract for 21 miles of 16 and 20-inch pipe, while other parties have contracted for between 30 to 40 miles of 8 and 10-inch, and still others for a bout 100 miles of pipe of large size.

Cotton tie manufacturers are somewhat agitated over a possible interpretation of the drawback clauses of the McKinley bill. They believe that it may be possible to import the hoops under the drawback clause, attach the buckle in this country, and claim the drawback of 99 per cent. of the duties paid on the hoops imported, under the plea that the attaching of the buckle is a manufacturing operation. A similar claim might be successfully made for barrel and other hoops.

Henry Swindell, of the Swindell and Smythe Company, engineers and contractors of Pittsburgh, Pa., died at his residence in Allegheny, Pa., on Friday, the 23d inst., in the 52d year of his age. Mr. Swindell had been a resident of Allegheny all his life, and amassed a large fortune. The business of the old firm will be carried on under the same name by S. R. Smythe, the surviving partner.

No. 4 furnace of the Illinois Steel Works exploded on Sunday, the 25th, injuring several top fillers. The furnace was only slightly damaged.

The steel casting apparatus to which we referred in a recent issue is manufactured by the Solid Ingot Company, 800 Broad street, Newark, N. J. W. R. Hindale is president.

HARDWARE.

The Condition of Trade.

In this market there is an improved demand for goods, the volume of business still continuing, however, only fair. Orders relate largely to seasonable goods, and there is some complaint of dullness in Builders' Hardware. From other points advices are for the most part quite satisfactory, and it is evident that jobbers are doing a good business. There is, however, some irregularity in price, and a good many jobbing houses are offering concessions to induce orders. This practice prevails at the present time perhaps somewhat more than usual, as many of the wholesale trade had purchased staple goods with exceptional freedom, and they entered upon the season's business with full stocks. During the past week there have been comparatively few important changes in price, but the impression obtains that the market generally is in a somewhat improved condition, and there is evidence of a better feeling. In some lines of leading goods low prices still prevail, and on some of these a lower point has been reached since our last review than had previously been touched; but there are slight indications which point to a checking of this downward tendency, and it is thought in some lines at least that a halt has been called. In some of the most demoralized lines orders are being placed by some large houses, who have up to this time been waiting, and the impression prevails that such goods can be purchased as advantageously now as later, there being more prospect of a slight advance than of further decline. The general prosperity of the country strengthens the confidence of those who take a hopeful view of the situation, and the reports of excellent crops, the prospect for which has been improved in the Northwest by recent much-needed rains, tends also to give assurance of a desirable business during the remainder of the season and the closing half of the year.

The following is our special telegraphic report of the Chicago market:

The encouraging crop prospects of two weeks ago have been largely augmented in the last week, hence giving to the country dealer greater hope of a good trade during the summer and fall season. Consequently orders are coming in more rapidly from the agricultural districts, and the Hardware jobbers are having, if anything, a greater trade than they did have the earlier part of the month. The percentage of increase in business for this month over the same month a year ago is a matter of astonishment and congratulation to some of the jobbing houses, but the general tendency as the season advances is toward higher prices. The advance in raw Copper is stiffening up all raw goods in which the finished material is used in the manufacture, and the chances are largely in favor of a slight advance.

Cut Nails.—There appears to be an improvement in the condition of the Nail trade. In the last few days makers have withdrawn quotations and are now asking an advance of 5 cents a keg. On a lot of 1500 kegs, 25 cents average, $1.65 at mill was refused, the concern stating that their bottom price was $1.70. It is also said that there are mills which are asking $1.75. If these prices are maintained it is one step toward an advance from the lowest prices. Local buyers are not of the opinion that there will be any great change, and are, therefore, not inclined to place large orders. From stock jobbers quote $1.90 in small lots, with the usual reduction for larger quantities.

Wire Nails.—This branch of the Nail trade is in a better condition. Makers in the West say that they are full of orders, and have advanced their prices at mill to about the same figures at which Wire Nails were delivered in Chicago three weeks ago. Jobbers are unable to duplicate their last contracts at less than 5¢ ₱ keg advance. From store jobbers quote 2.35¢ @ 2.40¢ according to quantity.

Barb Wire.—The recent active trade has about cleaned up all the surplus Wire in the market. Manufacturers are now running on orders and are decidedly firm in their prices compared with last Monday. They hold that the bottom has been touched and that the only course of the market from now on will be upward. Painted Wire, in carload lots, is quoted at 2.70¢ and Galvanized at 3.30¢, with the usual advance for small lots.

Wire Nails.

A week or two ago there were in some quarters indications of something of an improvement in Wire Nails, but whatever tendency there was in this direction appears to have been thus far only temporary, and the market has since lost whatever was thus gained, so that at this writing prices are even a shade lower than at our last review. A good many orders have, however, been placed and most of the mills are well occupied. Quotations are on the basis of $2.15 for carload lots at mill with slight advances for smaller parcels. The price from store for small lots may be named as $2.35 to $2.45.

Barb Wire.

During the past week there has been comparatively little change in the situation, with, perhaps, a slight falling away in price. Some exceptionally low quotations are being made by leading mills, which, however, some of the manufacturers refuse to meet. With Four Point Galvanized at 3 cents, or a shade lower at mill it is obvious that the market is in a condition far from satisfactory. Some of the manufacturers are, however, holding at prices ranging from 3.15 cents to 3.20 cents in large lots at mill, with moderate advances for smaller parcels.

Cut Nails.

During the week under review sales of round blocks have been made at very close prices, which have somewhat unsettled the market. Little improvement is hoped for during the coming month by close observers. We quote $1.70 @ $1.80 for Iron Cut Nails, on dock, in carload lots.

Miscellaneous Prices.

An adjourned meeting of the Wrought Iron Pipe and Tube Manufacturers' Association was held at the Hotel Anderson, Pittsburgh, last week. The feasibility of grading prices for the different classes of trade was considered, and a slight change made in the terms to the largest buyers.

The following is the price list of the Sauce Pans, Kettles, etc., manufactured by Hall & Carpenter, 709 Market street, Philadelphia, and described in a recent issue, the discount being 25 per cent.:

	2	3	4	6 qts.
Sauce Pans and Kettles,	60¢,	70¢,	80¢,	$1 each.
	No. 1.	No. 2.	No. 3.	No. 4.
Stew Pans.....	55¢,	65¢,	75¢,	90¢ each.

The following are the list prices on the Aurora Hammock Spreaders, &c., described on page 928, and manufactured by Richard W. Montross, Galien, Mich. The list is subject to discounts for quantities:

Hammock Spreaders, per gross.....	$9.00
Head Rests, per dozen.....	4.50
Support Ropes, per gross.....	12.00

The price of Colton's Key Ring Screw Driver, illustrated among Hardware novelties in this issue, is quoted as follows by H. H. & C. L Munger, 142 Lake street, Chicago, who are sole agents for the manufacturers. Plain finish, per gross, $16; full nickel plated, polished, per gross, $24; discount, 40 %.

Since our last review of the market there have been two advances in Shot. Under date of May 21, the following prices were announced:

Drop Shot, per 25-pound bag.....	$1.25
" " " 5 " "	.30
Chilled and Buck Shot, per 25-pound bag	1.50
" " " " 5 " "	.35

Under date of May 22, a further advance was made as follows:

Drop Shot, per 25-pound bag.....	$1.30
" " " 5 " "	.31
Chilled and Buck Shot, per 25-pound bag	1.55
" " " " 5 " "	.36

The above prices are subject to a discount of 2 cents per 25-pound bag, if paid within 5 days from receipt of bill, and also to the regular trade discount on ton lots. Present prices are regarded as very firm, and it is not improbable that a further advance may be made.

There are some signs of improvement in the Sand Paper market, which, however, can still be referred to as low and irregular. Some of the extreme quotations on the better grade of Papers have, however, been withdrawn and quotations are a shade higher. The common grades are substantially as before.

The Tack market is in a decidedly unsettled state. The failure to carry out the attempt arranged for control of the market has been followed by a break in prices

with considerable demoralization. Large concessions from the former basis of 70 per cent. discount on Carpet Tacks are freely made, but with so much diversity of quotation that it is difficult to name a price. Comparatively few of the manufacturers have as yet issued discount sheets, and there is an evident disposition to wait until the market becomes more settled.

In Plain Wire there has been since our last review no quotable change, but the condition of the market is regarded as slightly improved as there is less disposition on the part of manufacturers to make concessions with a view to inducing sales. This improvement, though slight, is regarded as significant by some experienced observers, and it is thought not unlikely that there may soon be an apparent improvement as higher quotations are made.

A joint circular has been issued by Palmer Hardware Mfg. Company, Troy, N. Y.; Empire Portable Forge Company, Lansingburgh, N. Y., and Stover Mfg. Company, Freeport. Ill., withdrawing quotations on Common Sense, Empire and Ideal Sash Pulleys, in the prices of which a slight advance has been made. Common Sense and Empire Pulleys are shipped f.o.b. Troy, N. Y.; Reading, Pa., or Cleveland, Ohio, and the Ideal Pulleys f.o.b. Freeport, Ill. The sale of Common Sense Pulleys in New England, New York, New Jersey, Pennsylvania and Delaware is, we are advised, controlled by Peabody & Parks, Troy, N. Y., as heretofore.

Proposed Form of Contract.

Some jobbers are disposed to criticise the form of contract given in our issue of the 15th inst., as proposed by the Pittsburgh conference of manufacturers. They make the point that the contract has evidently been gotten up with a view to the manufacturers' interests, and is altogether too one-sided. One jobbing house refers to it in the following terms:

The proposed contract we fear will not solve the difficulty, for the reason that few jobbers would take the time to read it, let alone sign it, as anything nowadays which tends to complicate business is looked upon as an annoyance and will not be tolerated in the present day of short cuts.

Some of the manufacturers also are not entirely satisfied with the proposed form as a desirable one to press for general adoption, a view which, we are advised, was taken by the manufacturers who were represented in the meeting at Pittsburgh last week. At this meeting there was a fair attendance of Wire, Wire Nail and Cut Nail manufacturers, about 25 firms being present. Thomas Joplin presided, and S. K. Wallace, president of the Jefferson Iron Works, Steubenville, Ohio, acted as secretary. The day was spent in discussing the question of the best manner and way to form a contract that, while being legal and binding on the purchasers of manufactured articles, would also be acceptable to them. Without coming to any conclusion on the subject, the meeting adjourned, to be called together again by the president as soon as certain legal questions connected with the formation of a contract can be investigated and the views of absent manufacturers ascertained. The feeling was, we are advised, unanimous in favor of adopting and rigidly adhering to the form of contract heretofore presented, with certain slight changes in it, as referred to above. A good many in the trade, however, are disposed to look upon the attempt to correct the existing system, whereby manufacturers give exceptional options to their customers as likely to be without practical result, their position being that manufacturers find it to their interest to give their customers as many privileges as they can, thus strengthening their hold upon them and securing their further business. On this point a well-known house writes:

We hardly believe that a rule can be adopted which will be at all times practicable for so long as more goods are produced then can be consumed; there will be concessions made by manufacturers, especially at such times as stocks are accummulating and friendly jobbers are ready to unload them for light concessions in price or date of payment with "price guaranteed against decline." Commerce is like water and will find its level.

The Export Trade.

Trade with South America is represented as fair on the whole, though interfered with in some cases by special existing conditions. In Brazil the unsettled political situation has a disturbing influence to such an extent that business is not at all satisfactory, and in the Argentine Republic financial matters are so unsettled that merchants there are holding back their orders and deferring shipments. The hope, however, is entertained that there will be an improvement in both of these countries before long. Business with Chili and Peru is referred to as very good and also with Venezuela and United States of Columbia. The condition of trade with Central America, Mexico and Cuba is also quite satisfactory.

Business in South Africa continues good, while in Australia trade has had quite a setback owing to the continued floods in New South Wales and Queensland, notwithstanding that the year was started with the best prospects for a good season, but the great floods have changed the aspect entirely. It is stated that many of the retailers in the inland towns have been ruined, and as they are most of them heavily in debt to the importers, a large share of the loss falls on them. In regard to this market the following advices will be of interest:

Aside from the outside losses the importers have lost very heavily from total loss or damage to their own stocks, one house alone in Brisbane losing $100,000 from damage to stock in their warehouse in which the water was 14 feet deep. At present it is impossible to estimate the great damage that has been done. Not only floods have visited the country, but the district near Townsville, in Queensland, has been visited by a cyclone which has done great damage to the sugar crops. Latest reports state that the city of Bourke, one of the largest of the inland cities, is at present surrounded by a vast sea of water from the overflow of the rivers, and that if it rises a few more inches the city will be inundated. People have been leaving there for some days, as it seemed as though the city could not escape being flooded although everything possible has been done to protect it.

These catastrophies will explain the depression in the export trade, and manufacturers who are at a large expense trying to obtain this business should be patient for a few months, when in all probability it will pick up again. Vessels to these ports continue to load at low rates. The rate on the Melbourne vessel which has just closed was 12¢ per cubic foot and the rate on the next vessel will probably be the same.

Cancellation of Orders.—What the Jobbers Say.

It is evident that the discussion of this subject is beneficial to the trade, and the prospect is that an effort more or less united will be made by manufacturers in certain lines to put a stop to the present fast and loose system of selling and buying goods. The attention of the trade has already been directed to the extent to which the practice in question is carried, and some houses have expressed their surprise at the condition of things which has been brought to light. In their steady-going conduct of business, buying in a businesslike way such goods as their trade required, opportunities were not offered them by manufacturers for the placing of orders the execution of which was to be dependent on the course of the market. In like manner some manufacturers in whose lines these practices have not to any great extent prevailed have expressed surprise that any manufacturers should be willing to follow such unbusinesslike methods, and some manufacturers have written to us protesting against such an implication as applying to them. There is, however, general agreement that it is well to have attention called to the disadvantages of this method of buying and selling goods, the hardship which it entails upon the manufacturer, the mischief which it causes in the trade at large, and the unbusinesslike character of such a practice.

In some of the discussions on this subject the impression has been given by those writing from the manufacturer's standpoint that the purchasers of goods are to bear the blame, in large measure at least, of the present way of doing things, an implication, however, which our jobbing friends are prompt to repudiate. They make the point, and very reasonably, that if the manufacturers give them such options in regard to the execution of orders it is the right thing for them to take advantage of the opportunity, and that if the order is accepted with the understanding that its execution is dependent upon the advance of the goods or the maintenance of existing prices, the purchaser is quite right to countermand the order in case there is a break in the market. This point is clearly brought out in the follow-

ing admirable letter from one of the largest jobbing houses in the country:

"It would seem from the tone of the letters from the manufacturers on the subject that the jobbers are solely and entirely to blame; that they are like the man who loses his money at the gaming table and then turns around and sues the winner to recover the same. The fact of the matter is the fault lies with the manufacturers. Many of them in their eagerness to obtain orders solicit them with the distinct understanding that in case of a decline any unfilled portions of the orders may be canceled. It is as much a part of the contract as the price itself, and it has become so common a practice that the jobber takes it as a matter of course. There is no doubt but that it is unpleasant for the manufacturer, and that it is not "business," but many things have crept into trade methods of late years that are unpleasant and unbusinesslike. Do not, however, blame the jobber for them all. He will take all he can get, and the manufacturer who gives the most, whether it be in price or in privilege, gets his orders. When a halt is called the jobbers will step up and take their medicine like little men."

In the following letter our correspondent, a prominent Hardwareman, whose views are entitled to weight, points out, it will be observed, that there are certain circumstances in which orders may legitimately be canceled, and in which prices can with propriety be guaranteed, while at the same time he refers in emphatic terms to the demoralizing influence of the practice in question, alluding especially to its effect in dulling the sense of business honor which should be regarded in all transactions:

The question of permitting the cancellation of orders is a very large one and can be argued pro and con *ad infinitum*. The practice has become so common and unquestionably evil in its tendency that the time has arrived when manufacturers must take a positive position for their own salvation. Yet, with all this, there are conditions in which prices should be either guaranteed or cancellations permitted—*i.e.*, suppose manufacturers enter into a combination to advance prices, as a matter of protection from a condition of the market that makes competition simply ruinous, and ask the support of the large distributors. In such a case where the support is given, and from some cause the effort proves a failure, then cancellations should be granted without the asking. Again, seasonable goods—orders placed in advance for the advantage of the manufacturer, &c. Exception should be made to cover these and other special cases. Although our position is from the jobbers' standpoint, we cannot think but the habit is a pernicious one and is injurious to the whole trade, manufacturers and merchants. It would be better, more wholesome and healthier, if it were abolished. The buyer then stands upon the plane on which his ability places him. If he is studious, industrious and careful, reasoning from cause to effect, he and his house reap the benefits of his painstaking, laborious efforts instead of having his ability reduced to the common level by the every day competitor levelling up with him by canceling orders which his erroneous judgment permitted him to place. Another evil from the placing of these extraordinary fictitious orders is the tendency to boom the market, leading astray the manufacturer by creating an apparent demand which does not exist. Again, it destroys that true sense of honor which should pervade all merchants—that a contract is an agreement not to be broken at will or from the cause of any whim or imaginary reason why they should not keep their arrangements. We should from our position, "where we are compelled to do much on faith in our fellow man," do everything to elevate in standard of excellence the thought and action of all with whom we come in contact, and, therefore, do nothing that will, in its tendencies, assist in lowering the high standard.

This ignoring of contracts is demoralizing; we are imperceptibly inculcating into the minds of our business people a theory that may eventually destroy the whole fabric upon which our present system is established. Permit me to here ask the question, would it not be well to begin the eradication of this evil by manufacturers and merchants refusing to solicit business for any line of goods before the season for them? This would go a great way in doing away with the necessity of guaranteeing prices, and would enable every one to realize a profit on their sales or at least to know their selling price.

In the letter printed below our correspondent condemns, it will be observed, the practice in strong terms and alludes in way of criticism to the form of contract which was suggested by the recent gathering of manufacturers at Pittsburgh:

I have read your article about repudiation of contracts. The custom is a bad one, and if as prevalent as claimed, should be frowned upon by all honorable merchants. I can only speak for myself and can truly say that during the history of this house and its predecessors they have never declined to take goods contracted for because of a decline in the market or any other cause: but if, as is claimed, the custom is almost universal, the fact argues that no house which is high-toned and honorable can compete in the general market. There are some universal conditions in the form of contract given in your paper of this week, but as a whole it would not suit my business, and I do not think everyone could use it, as a contract would necessarily be varied according to circumstances. After a contract is made it should be carried out in accordance with the understanding, and any man or company that does not take goods they buy should be reported to the commercial agencies, which would soon make the practice disreputable.

That the remedy lies with the manufacturers is pointed out in the following letter from a well-known Southern house:

If the custom has grown to such a degree as to become a hardship, we think the remedy lies with the manufacturers themselves. The art of buying becomes a very simple one when the buyer is allowed or induced by the manufacturers to place orders far beyond his legitimate wants, knowing that should the prophesied advance occur he will have an opportunity to unload and demoralize the market, and should it not occur that he can avail of the privilege so graciously accorded him by the manufacturer of not taking the goods. If the custom exists to the extent indicated in your columns we hardly think that the buying public will ask for its discontinuance; its very extent proves its popularity, though its disadvantages are not merely those of the manufacturers. They belong to all, perhaps more apparent in one case than the other.

Our correspondent, whose letter is printed below, refers to the practice of manufacturers in ignoring orders for goods which have advanced since their purchase, and the practices to which they sometimes resort to avoid the shipment of the goods at the low figures agreed upon. The point he thus makes, and his suggestion in regard to the recognition of the binding obligation of every contract, will be appreciated by our readers:

The practice of canceling orders on a declining market by buyers is just as unbusinesslike and unfair as the practice of pigeon holing orders by manufacturers on an advancing market. The trade cycles run their course about this way: After a long weary struggle for existence, after the weakest concerns have been pretty well weeded out, and after both consumers and dealers have learned by bitter experience to buy only from hand to mouth; about the time when the manufacturing capacity and the stocks held by dealers are at their lowest limit, some few shrewd buyers begin to see that the line where the supply equals the demand has been passed, and place their orders freely. Other buyers soon fall into line, and so one by one the manufacturers fill up with orders, become independent and advance their prices. Now the whole order of things is reversed. After shrewd buyers have placed their orders the whole crowd of mediocrity come into the market with a rush. Before the advance no inducement was great enough for them to buy; now they can't get enough goods. It is so pleasant to see money grow on your shelves, to grow rich without an effort, to see your property increase in value while you are asleep. Of course, the rush of purchasers creates a further advance and every profitable purchase is an inducement to buy more. Both manufacturers and dealers, in their anxiety to make money by advances, with far off visions on their minds of a summer trip to Europe or Long Branch, totally ignore the consumer, whose dimished purchases, coupled with the increased production, will inevitably bring on the final collapse. The manufacturer is by no means exempt from the vein of trickery which still runs through human nature. While the fever is high some manufacturers unceremoniously sidetrack your orders, which were placed and taken in good faith, and fill later orders at better prices. All your kicks and scowls are in vain, and only draw out a lot of well-known excuses. If they don't worry you into a countermand they will shove the goods in on you just in time to catch the collapse. On the other hand, the enthusiastic dealer, as soon as he becomes disenchanted, promptly cancels all unfilled orders, thus repudiating his contracts without caring what loss or inconvenience he may cause the manufacturer. This is all wrong. Every contract entered into by buyer and seller should be carried out in good faith by both parties. The only remedy I can suggest is that in every contract for future delivery both vendor and vendee should bind themselves to pay a specified amount in case of cancellation, and the vendor should also bind himself to pay a certain sum for every day of delay beyond the time agreed upon.

Trade Topics.

Some branches of wholesale business closely allied to the Hardware trade seem to have prices demoralized immediately following one or two years of good trade. People having a small amount of money laid aside, watching for openings which promise best returns, think they see their chance in this or that line, and start a jobbing business. Such concerns are known to the regular trade as "little fellows." The retail trade are visited by their salesmen who travel on a very small commission, and sell at ruinous low prices. Such prices not only greatly annoy the established houses, but also keep the retailer in an uncertainty in regard to

legitimate prices. These houses also draw a considerable portion of their business from the consumer, which naturally makes them obnoxious to the retailer. Stringency in business usually wipes these people out, the vacancy being filled by others upon revival of business.

The growth of the Cutlery department of Horton, Gilmore, McWilliams & Co., Chicago, is an illustration of what can be accomplished by energy specially directed. The sales of this department always have constituted an element in the business of the house which was not to be despised, but up to about two years ago it was by no means conspicuous in comparison with the results shown in sales of other articles in the Hardware line. Since then measures have been adopted to push the Cutlery trade more vigorously, and the result has been the building up of a volume of business from eight to ten times as great as formerly. The growth of this department has been continuous from the time when special push was given it. For the month of April just past, the sales of Cutlery were very much in excess of any previous month. Although the goods in this line have the brand of the Union Cutlery Company, and are known by that name, the Cutlery department is under the direct management of the firm and is not conducted separately. In immediate charge of the departmennt is Wm. G. Westgate, long and favorably known to the patrons of the old house of William Blair & Co., the predecessors of the present firm. The Cutlery department carries a complete stock of Penknives, Scissors, Carvers, Table Knives, Plated Ware, &c., with a huge variety to select from in every line. In building up the trade this was made a special point, the outlay for the necessary stock being deemed absolutely essential in establishing the foundation of a successful business venture. Goods of special quality were also brought out from time to time to secure the favor of the trade. An instance in point is the Mascotte Razor, the sale of which has exceeded all expectations. The other departments of this house have shown a gratifying increase in business in the past year. Their bicycle trade has been particularly heavy, running far ahead of that of last year.

A correspondent in New York State, referring to the English BB White Lead, which has so largely disappeared from the market, writes as follows:

The sale of English White Lead in Oil is limited by some difficulties, like one boy in swimming when a second boy climbs on his back. It costs too much, and obstacles are thrown in the way of importation and consumption hard to be overcome though not for lack of merit. I have used it for many years, and prefer it, as I do not wish to use any unreliable drug, beverage or manufacture whatever made.

A subscriber in Virginia refers in the following terms to the practice of jobbers shipping goods to retailers with their names on the tags:

This custom is a great nuisance to us. Only last week my competitor came and got the address of some parties whose goods were coming into my store. I make it a rule to pull them off as soon as I get my hand on the goods, but he was too quick for me on that deal.

Obituary.

Franklin Hallock, of Franklin Hallock & Co., Birmingham, Conn., who for the past 40 years has been in the Hardware business in that city, died May 6, in the sixty-third year of his age. Reference is made to the success which he attained in business and the high esteem in which he was held by the community.

We regret also to announce the death of Thomas Laughlin, senior member of the firm of Thomas Laughlin & Son, Portland, Me., in the Seventy-third year of his age. For a few days Mr. Laughlin had been suffering with a severe cold, but his condition was not regarded as critical and the end came unexpectedly. The firm of which he was the head was established in Portland in 1866, but Mr. Laughlin continued to reside in Pembroke for four years, removing to Portland in 1870, since which time he has been actively engaged in business. He belonged to a race of iron workers, he and his nine brothers having learned the trade of blacksmithing from their father. He had taken full charge of the forge department in the factory during the entire time of his residence in Portland. We are advised that arrangements had been nearly completed by which he was to retire from business, but his death occurred before they were carried into effect. He leaves a widow and six children. The appreciative manner in which he is referred to by the press of Portland indicates the high esteem in which he was held, and as he had been prominently identified with the business interests of the city, it is intimated that his loss will be deeply felt.

Items.

In the advertisement on page 77 an illustration is given, it will be observed, of Lane's Patent Parlor Door Hanger, manufactured by Lane Bros., Poughkeepsie, N. Y., for whom John H. Graham & Co. are agents, 113 Chambers street, New York. An enumeration is also given of some of its special features.

Our readers will observe among the Special Notices on page 55 one signed "J. M. C.," in which it is intimated that a position of trust and responsibility is desired by a gentleman who has had experience as treasurer and general manager of a large manufacturing corporation. It may be added that the advertiser is recognized as a gentlemen of ability and high character, so that this announcement will be of interest to those who have an opening for such a person in their business.

We are glad to note the growth of one of the younger Hardware houses in the Northwest. The Seattle Hardware Company, of Seattle, Wash., began business in 1885, and grew with the growth of the city and the Northwest, and, like all business houses in that city, suffered by the fire of June 6 last. After the fire the demand for the establishment there of a thoroughly equipped wholesale house was so great that the capital was increased, and the Black Hardware Company, of Detroit, becoming interested in the company, they are especially well prepared to take care of the jobbing trade in this important section. On July 1 they expect to move into their new store, which, with their complete stock, will be ample for the large trade and demands of that section of the country.

Manufacturers of Refrigerators refer to the lack of ice or the comparatively high price at which it is held in many parts of the country, as interfering considerably with the sale of their goods, which thus far has not been as good as was anticipated.

A folder containing a variety of information in regard to Winston-Salem, N. C., has been issued. It indicates something of the growth of the city, the industries established, &c.

In the description given in our last issue of the Calking Vise of the Kinsley Iron and Machine Company, Canton, Mass., the address of the company was erroneously given as Canton, Ohio. The trade will please note the correction, this well known company being located at Canton, Mass.

At a recent meeting of the Carriage Hardware Association prices as announced January 22, 1890, were reaffirmed.

C. Warren Cheney, Athol, Mass., is introducing an adjustable Fork Wrench. This is described as being unlike wrenches of this kind, in having a ratchet thread on the thumb nut, instead of a square thread, a consruction which is alluded to as not breaking under a strain. These wrenches are nickel plated, having flat handles, with a hole in the end of the handle for hanging them up.

An exchange describes a test of the Self-Setting Bench Plane, manufactured by the Gage Tool Company, Vineland, N. J. Referring to the work done, it states that a thin shaving was taken from a hard hemlock knot without seeming to effect the edge of the bit. Other difficult cross grained hard woods we planed with like results.

Price-Lists, &c.

Tucker & Dorsey Mfg. Company, Indianapolis, Ind., have issued a new and tasty catalogue relating to their Alarm Tills, Stove Trucks, Saw Bucks, Kraut Cutters, Towel Rollers, Towel Racks, Folding Hat and Coat Racks, &c. Stone's patent Barrel Truck, Warehouse Trucks and Casters are also represented in it.

The American Bit Brace Company, 122 to 126 Washington street, Buffalo, N. Y., issue an illustrated price-list of Bit Braces manufactured by them. They refer to their system of numbering their Braces as being more convenient than Roman characters. The size is expressed by the two right hand figures in each number (which is stamped on the sweep), the extreme left hand figure denoting the kind of handle. Thus, the number 1012 signifies a 12-inch Brace, with cocobola handle, 1 being the left-hand figure and signifying cocobola. No. 2 signifies cherry, No. 3 black walnut, &c. It is intimated that their intention is not only to maintain but to improve upon the high standard of their goods.

The Atlantic Stone Co., Boston, Mass., issue an illustrated price-list of Grindstones, and refer to the fact that their quarry properties produce all Grits that have established reputation, and they are in a position to offer consumers the Stone best adapted to their needs. Stones are furnished both mounted and unmounted, and in all desired sizes.

C. W. Arny & Son, 228 North Third street, Philadelphia, Pa., issue an attractive and carefully compiled catalogue relating to the Leather Belting, Rubber Goods, &c., which they are putting on the market as manufacturers and dealers. It contains much interesting matter illus-

trated with suitable cuts. Their principal article of manufacture is their Peerless Leather Belt, to the quality of which, and its adaptation for its use, they especially refer as the result of continued improvements. They advise us that they are manufacturing for customers whose demands are for the highest efficiency with price as a secondary consideration, and they are therefore now giving their entire attention to the production of this belt.

We are advised that Wilson Bohannan, Brooklyn, N. Y., is at work preparing a new catalogue which it is expected will be issued about September. It will embody the extensive line of patented Locks formerly made by this firm, together with a number of new ones which have just been completed.

Exports.

PER BARK TERESA COSNLICH, MAY 16, 1890, FOR WELLINGTON, NEW ZEALAND.

By Welsh & Lea.—5 cases Iron Bolts.
By Meriden Britannia Company.—1 box Plated Ware.
By Henry Disston & Sons.—1222 pounds Hardware.
By W. & B. Douglas.—69 Pumps.
By R. W. Cameron & Co.—82 packages Agricultural Implements and 24 Wheels.
By Coombs, Crosby & Eddy.—5 dozen Axes, 1 gross Indian Stone, 14 dozen Axes, 7000 feet Fuse, 6 gross Knives and Forks, 12 dozen Straight Trimmers, 2 gross Hardware.
By W. H. Crossman & Bro.—1 dozen Fifth Wheels, 18 dozen Rakes, 11 dozen Blocks, 1 Drill Machine, 16½ dozen Axes, 3 dozen Sash Cord, 8 packages Hardware.
By Arkell & Douglas.—1875 pounds Horse Nails, 3200 pounds Iron Bolts, 1 bale Sash Cord, 10 dozen Hay Forks, 672 pounds Oil Stone, 1 dozen Emery Wheels, 40 dozen Wrenches, 7 Stoves, 5 dozen Hammers, 2 dozen Bench Screws, 820 pounds Iron Castings.
By the F. B. Wheeler Company.—12 dozen sets Sad Irons, 2 dozen Saws, 6 dozen Hammers, 9 cases Tinware, 6 dozen Fly Traps, 10 dozen Axes, 1 box Stocks and Dies, 28 Pumps, 1 case Rubber Goods, 7 dozen Drills, 4 dozen Wrenches, 3 dozen Axes, 7 cases Hardware.
By H. W. Peabody & Co.—6 dozen Wringers, 5 packages Hardware, 12 dozen Lanterns, &c., 4 Lawn Mowers, 36 cases Hardware, 2 cases Rubber Goods, 27 packages Hardware, 1 case Bolts, 2 cases Rakes, 53 Pumps, 13 Churns, 1 package Thermometers, 22 dozen Traps, 2 cases Wireware, &c., 300 pounds Nails, 6 dozen Spades, 4 packages Grindstones, 5 dozen Wringers, 2 packages Pumps, 6 dozen Sash Lines, 3 cases Hoes, &c., 1 case Wringers, 57 packages Hardware, 6 cases Bolts, 4 packages Traps, 6 dozen Rakes, 56 pounds Stone, 1 dozen Step Ladders, 12 dozen Scythe Handles, 2015 pounds Barb Wire.
By R. W. Forbes & Son.—32 packages Hardware, 41 dozen Axes, 42 dozen Axe Handles, 2 casks Pumps, 3 dozen Stencils, 72 dozen Mouse Traps, 14 dozen Forks, 2 barrels Blocks, 12 dozen Bush Hooks, 12½ dozen Toy Wagons, 9 packages Churns, 18 packages Hardware, 1 case Hardware, 1 case Emery Wheels, 8 boxes Lawn Mowers, 2 crates Sad Irons, 16 boxes Meat Choppers, 6 packages Hardware, 5 dozen Apple Parers, 8 packages Scales, 40 dozen Hay Rakes, 120 dozen Tool Handles, 3 packages Hardware, 384 dozen Axe Handles, 16 packages Churns, 300 pounds Nails, 50 dozen Axes, 5650 pounds Horse Nails, 9 packages Churns.
By McLean Bros. & Rigg.—5 Lawn Mowers, 13 dozen Hammocks, 1 gross Nutmeg Graters, 2½ dozen Wringers, 12 dozen Mouse Traps, 24 dozen Oil Stones, 16 dozen Hammers, 6 dozen Mattocks, 18 sets Axles, 8 cases Horse Nails, 1000 Cartridges, 2 Drills, 26 Pumps, 1 dozen Meat Choppers, 20,000 Bolts, 6 dozen Broilers, 11 Lawn Mowers, 6 Vise Grips, 1 Tire Shrinker, 2 dozen Pipe Wrenches, 5 cases assorted Castings, 10 Scales, 4 dozen Bird Cages, 3 dozen Rat Traps, 18 dozen Fly Traps, 2 Plows, 10 dozen Rakes, 14 dozen Axes, 1 Crimper, 5 dozen Axes, 2 cases Hardware, 72 dozen Traps, 6 Stoves, 92 dozen Garden Tools, 3 dozen Picture Cord, 1 case Hardware, 300 pounds Nails, 4 dozen Locks, 12 dozen Wrenches, 1 dozen Axes, 10 Scales, 14 dozen Blocks, 3 dozen Churns, 2 Lawn Mowers, 1 case Agateware.

PER BARK ANGARA, MAY 16, 1890, FOR CAPE TOWN, SOUTH AFRICA.

By L. P. Rose.—25 Reapers and 10 boxes Repairs, and 20 extra Wheels.
By M. Berliner.—2 cases Scales.
By Leaycraft & Co.—5 gross Axle Grease.
By W. B. Fox & Bro.—920 pounds Axes, 1440 pounds Hatchets, 139 pounds Hardware, 150 pounds Agricultural Goods, 705 pounds Axe Handles, 168 pounds Meat Cutters.
By R. W. Forbes & Son.—3 packages Scrapers, 50 dozen Hammer Handles, 2 dozen Saws, 8 packages Churns, 13 packages Mowing Cradles, 6 dozen Rat Traps.
By Arkell & Douglas.—25 dozen Tools, 2 cases Handles, 6 dozen Fly Traps, 4½ dozen Stuffers and Choppers.
By H. W. Peabody & Co.—1 case Guns, 25,000 Cartridges and Primers, 6 Stoves, 6 dozen Brushes, 12 Pumps.
By J. Norton & Son.—31 packages Harvesting Machinery and 1103 pounds Repairs.
By W. H. Crossman & Bro.—10 dozen Hardware, 7576 pounds Sisal Rope, 6 gross Stove Polish.
By Strong & Trowbridge.—92 pounds Hardware, 10 Stoves, ⅜ dozen Plated Ware, 3 cases Rubber Goods, 75 pounds Fiber Ware, 3 Freezers, 2 Carpet Sweepers, 3 Wringers.
By Coombs, Crosby & Eddy.—1 dozen Axes, 3½ dozen Rakes, 4 dozen Tools, 3 Stoves, 9 dozen Bird Gages, 3½ dozen Churns, 56 dozen Tools, 2 dozen Rakes, 12 dozen Hardware, 2 dozen Mouse Traps.

PER BARK B. WEBSTER, MAY 17, 1890, FOR BRISBANE, QUEENSLAND.

By H. W. Peabody & Co.—24 dozen Picks, 16 packages Hardware, 9 dozen Thermometers, 6 packages Lampware, 12 Hoes, 18 Refrigerators, 9 dozen Hoes, 70 packages Hardware, 39 packages Plows, &c., 520 pounds Stone, 8 crates Churns, 1 package Castings, 2 packages Wireware, 73 packages Lawn Mowers, 60 packages Lampware, 10 cases Reaper parts, 5 packages Hoes, &c., 28 packages Pumps, &c., 6 cases Freezers, 33 Shellers, 1 case Tacks, 1 Wringer, 1 case Emery Wheels, 8 packages Hardware, 44 packages Road Carts, 1 case Bolts, 3 packages Hardware, 500 pounds Nails, 23,891 pounds Wire, 12 Corn Shellers, 6 Freezers, 1 case Hardware, 36 Plows, 1 case Tacks, 4 cases Woodworking Machinery.
By E. T. Hopkins.—5 Stoves.
By Arkell & Douglas.—23 dozen Hatchets, 2 dozen Blocks, 8 dozen Wrenches, 1170 pounds Bolts, 4 Lawn Mowers, 24 dozen Hames.
By Pell & Scott.—1 Road Cart.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

The local distribution of Paints and Colors in general is reported as having been very satisfactory the past week, and and the majority of manufacturers and jobbers assert that the movement the past month has, so far at least as the more staple commodities and prepared Paints are concerned, run more or less ahead of deliveries during May last year. Production of the leading pigments is large, but the outlet appears sufficient to absorb the greater portion of it, and that fact, along with the high cost of most crude materials, operates to keep values remarkably firm. The enhanced cost of Pig Lead, Zinc Ores, Linseed Oil and Quicksilver is particularly noticeable in this connection, and present appearances suggest that any reduction in cost in the immediate future is highly improbable.

White Lead.—Corroders report a good movement of their product, and the pure article, to all accounts, is being consumed in increased quantities despite the expansion of trade in inferior pigment. Jobbers are still distributing both pure Lead and mixtures to a liberal extent, and there seems to be no departure from the prices that have ruled since the spring season opened. The management of the Lead Trust do not consider the rise in cost of Pig Lead sufficient to warrant an advance in prices for their product at the present time, and the smaller manufacturers, as a matter of course, make no change in their quotations. Should the cost of the crude material settle at about the figures that have ruled the past ten days, however, an advance on White Lead about July 1 would not be surprising.

Red Lead and Litharge.—In this line of goods business is fairly active and prices remain firm, as quoted for some time past.

Zincs.—Prices for American oxide from both manufacturers' and jobbers' hands are firm, with the range about the same as heretofore. There is a good, steady demand that alone has a favorable influence, but the position of the market for raw material serves to give values a certain degree of firmness also. Foreign brands are quoted at the old prices, and the market is very firm with demand steady.

Colors, &c.—The market for all the staple Colors, dry and in oil, remains quite firm, with previous quotations ruling and the demand good for both house painters and grinders' stock. Prepared paints have been selling in a fairly satisfactory way to both local and out of town trade at old prices. There is no perceptible change in the condition of the market for Chalk, Whiting, Paris White or Clays.

Oils and Turpentine.—Trade has been rather slow the past week. That is to say, there have been very few, if any, transactions in Oils on a large scale, while the general distributive movement con rasts in no marked degree with what is customary at this season of the year. On prices for cotton seed products a slight reaction is noted; Lard Oil, too, has weakened a trifle, and Red Oils may be obtained rather more cheaply. Otherwise values stand the same as they were last week, and existing conditions give no indication of any radical changes in the immediate future. Increasing supplies of Turpentine here and at primary points are having a depressing effect upon prices for the article.

Linseed Oil.—City manufacturers report a very satisfactory volume of business, and supplies coming in from outside sources are not sufficient to have any disturbing effect. The latter are disposed of at about 60¢, and city brands, raw Oil, bring 62¢ for domestic and 64¢ for Calcutta seed product.

Lard Oil.—City brands of prime winter are selling at 53¢, and present make at ½¢ @ 1¢ less, which prices show a slight decline. The change, however, is merely in keeping with that of the cost of crude material and reflects no unfavorable change in the general situation. Current business, in fact, is fully up to the average volume.

Cotton Seed Oils.—The market is scarcely as firm just now as it was earlier in the month. Sales are not as readily made at the old figures and even slight concessions have failed to attract attention. However, supplies are believed to be in good shape and offerings at present are chiefly from small holders.

Fish Oils.—There have been small arrivals of new crude Menhaden Oil and sales at 23¢ for good merchantable quality. As yet, however, the fishing has not advanced sufficiently to have any influence, and, with only a small supply of old stock on hand, prices remain very firm. Crude Whale and Sperm Oils are unchanged. For manufactured Fish Oils in general, prices remain steady and the demand is of about the usual character.

Red Oils.—Saponified is offered at 4¼¢ ℔ lb in carload lots, with limited sales, and Elaine is lower by about 2¢ ℔ gallon.

Spirits Turpentine.—The reports from the South note heavy receipts at the central points, and local supplies continue to increase although the consumption is large. There are now about 1500 barrels in first hands here, and 37½¢ seems to be the present market value for round lots from dock.

Triplex Spur Gear Block.

The general construction of this block will be understood by reference to the accompanying illustrations, Fig. 1 being an external view of the front of the block and Fig. 2 a view of the rear. All of the mechanism is symmetrically grouped upon a single horizontal axis, and is so arranged as to occupy as little vertical space as possible, thus obtaining the maximum hight of hoist. Power is applied to an

Weston's Triplex Spur-Gear Block.—Fig. 1.—Front View.

endless hand chain passing over the pocketed chain wheel on one end of the central shaft and is transmitted thereby to the train of spur gearing contained in the housing on the other side of the block. The main or load chain passes over a pocketed chain sheave in the center of the block, one of its ends being provided with a suitable hook for receiving the load and the other being looped up and permanently secured to the frame of the block. The latter arrangement diminishes the length of the slack chain, prevents it from fouling and adds much to the convenience of the block. The hand wheel at the left, Fig. 3, transmits power through the central shaft to the steel pinion on its opposite end, shown best in Fig. 4, which in turn engages with the three planet wheels surrounding it. The latter are of hard bronze and have cast with them a smaller series of pinions, shown in Fig. 3, which engage with the annular gear cast in the stationary frame of the block, as shown in Fig. 4. The three double planet wheels are carried in a frame which supports both ends of each of the pins forming the axles of the wheels. As the central shaft is turned, the whole cage and its three pinions must rotate slowly within the housing of the block. Referring to Fig. 3 it will be seen that the inner side of the pinion cage consists of a disk keyed to one end of the steel sleeve forming part of it, and carrying the hoisting chain sheave, so that the rotary motion of the pinion cage is thus transmitted to the sheave. The two hubs of the latter are prolonged to

Fig. 2.—Rear View.

form bearings on each side in the frame of the block and are bored through the center to permit the shaft of the hand chain wheel to pass through the sleeve thus formed. The mechanism described constitutes the entire gearing by which the load is hoisted and is obviously not self-sustaining.

The device by which the load is automatically sustained under all conditions, and whereby lowering is accomplished when desired, will now be described. By referring to Fig 3 it will be seen that the hand chain wheel is screwed to a sleeve keyed to the central shaft. When power is first applied to hoist, the effect is to screw the hand wheel against the series of friction plates shown in Fig. 3, which in turn bear against the disks rotating with the central shaft and carrying with it a roller check mechanism fitting into a recess formed in the left hand frame of the block. The construction is such that, so long as hoisting continues, the small steel rollers of the checking mechanism offer no resistance; as soon, however, as hoisting ceases, and the load causes reversion of movement, these rollers mount on their inclined paths and frictionally check the frame which carries them, preventing its further rotation. This frame in turn locks one set of the friction disks and prevents them from turning; the other set of disks, being frictionally engaged with the first, also remain stationary, and by their friction prevent the hand wheel from turning backward. The load thus remains automatically sustained and cannot possibly run down unless power be applied to the hand chain.

Lowering is accomplished by lightly pulling on the hand chain. The effect of this is to unscrew the hand wheel on its sleeve, the latter remaining stationary for

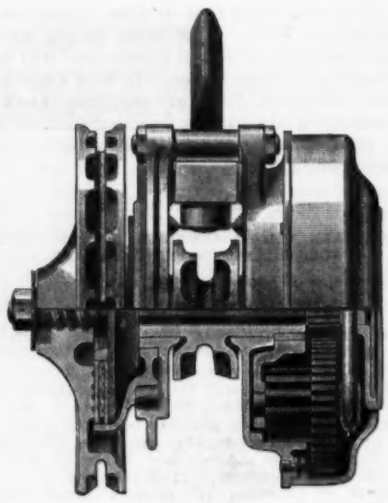


Fig. 3.—Transverse View, Lower Half in Section.

a moment under the influence of friction and inertia. As soon as this is unscrewed enough to release the two sets of disks from frictional engagement, the set which is carried by the sleeve of the main chain wheel begins to rotate backward under the impulse of the load. This motion, overtaking that of the other set of disks carried by the hand wheel, again forces the two sets into frictional engagement and tends to check the descent of the load. The continued rotation of the hand wheel, however, will again release the friction on the disks and again permit a further lowering. In point of fact, these successive releasings and engagements occur at such short intervals as to constitute a practically continuous movement, whereby the load descends smoothly and quietly as long as the hand chain is

Fig 4.—View Showing Gearing.

kept in motion. So long as the backward motion of the hand chain continues, the device just described operates smoothly and noiselessly, permitting the load to run down at rapid speed, but without acceleration, and with a pull on the hand chain which does not exceed 8 to 10 pounds when lowering the maximum load. If the

pull on the hand chain be discontinued the lowering action will cease. The pull required to lower is so light as to easily permit of "spinning" the hand chain, thus obtaining a fly wheel effect, and enabling lowering to be accomplished at high speed. This motion, however, can be controlled or instantly checked by the application of a slight resistance from the hand.

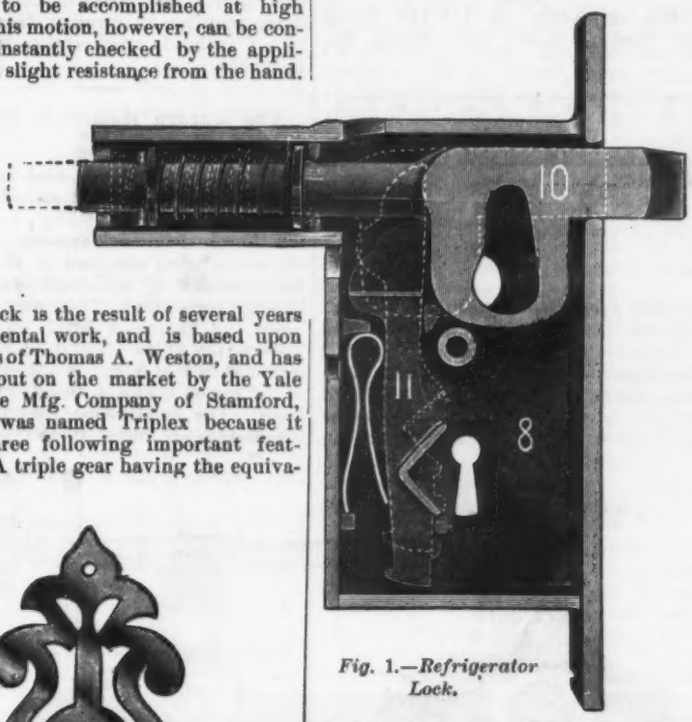


Fig. 1.—Refrigerator Lock.

This block is the result of several years of experimental work, and is based upon the patents of Thomas A. Weston, and has just been put on the market by the Yale and Towne Mfg. Company of Stamford, Conn. It was named Triplex because it has the three following important features: 1. A triple gear having the equivalent of three parallel shafts, each pair geared together. 2. A tripel sun and planet wheel motion, with three pairs of double pinions, insuring equal distribution of the load and large wearing surfaces. 3. Threefold the efficiency of its predecessors.

Fig. 5.—Refrigerator Escutcheon.

Prof. R. H. Thurston recently tested this block, together with some other well known makes, and found that this was the only block with self-sustaining power not due to excessive friction, and that it "develops a remarkably high efficiency as compared with any of the older types of chain blocks." He found that when hoisting the waste by friction was but 20½ per cent., while the lowest in any of the other blocks tested was 68 per cent.; the efficiency was found to be more than double any of the others, being 79½ per cent. When lowering a load of 2000 pounds the pull on the hand rope was only 8 pounds. The relative efficiency in both hoisting and lowering was three times that of any of the others.

Fig. 2.—Handle for Refrigerator Lock.

Fig. 4.—Hinge for Refrigerator.

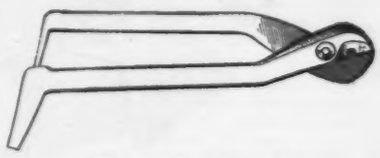
Challenge Iceberg Refrigerators.

The Challenge Corn Planter Company, Grand Haven, Mich., for whom B. B. Neal, 106 Chambers street, New York, is salesman, issue their fifth annual illustrated catalogue and price-list of their Challenge Iceberg Refrigerators. These are shown in many styles and finishes, and are alluded to as being made in a scientific and practical manner. In Fig. 1 we give an illustration of the locks manufactured for their refrigerators, and the manufacturers call attention to the advantage it has in drawing the door to a close, tight joint, by a slight turn of the knob, after closing the door. Fig. 2 shows the style of handle or key used with the lock. The self retaining caster used in their refrigerators is illustrated by Fig. 3. This is referred to as being so constructed as to stay in place when one side is raised in moving over obstacles. The trimmings, Figs. 4 and 5, we are advised, are used on their new style refrigerators only, and are here shown one-fourth the actual size.

Clark's Wire Cutter.

F. A. Clark, 20 Cliff street, New York, is the inventor of the wire cutter illustrated herewith, and is introducing the same to the trade. We are advised that these cutters are made of the best cast steel and hand forged. A notch is cut in the upper jaw to prevent the wire from being pushed out when cutting. The device is intended to cut No. 6 wire and lighter. These cutters are made in but one size, 12 inches over all, and can be used either in the bench, vise or hand. The cutting surface is ⅞ inch long, giving a powerful leverage, and is referred to as having no edges to break out. The blades are held together by a bolt and nut, and can quickly be taken apart for sharpening. These cutters are alluded to as being stronger and more powerful than the ordinary wire cutters.

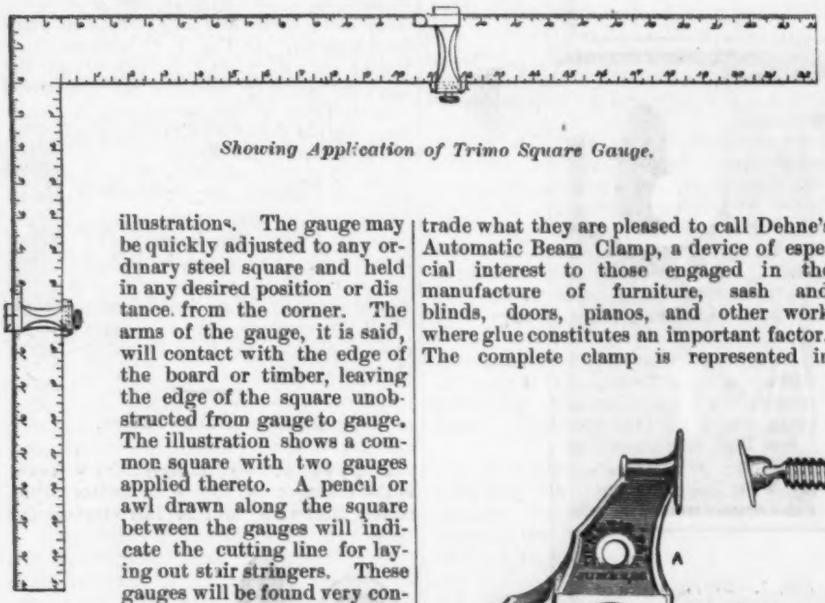
Fig. 3.—Self-Retaining Malleable Casters.



Clark's Wire Cutter.

Trimo Square Gauge.

The Trimont Mfg. Company, Roxbury, Mass., are introducing to the trade what they are pleased to call the Trimo Square Gauge, the application of which is clearly indicated in Fig. 7 of the accompanying illustrations. The gauge may be quickly adjusted to any ordinary steel square and held in any desired position or distance from the corner. The arms of the gauge, it is said, will contact with the edge of the board or timber, leaving the edge of the square unobstructed from gauge to gauge. The illustration shows a common square with two gauges applied thereto. A pencil or awl drawn along the square between the gauges will indicate the cutting line for laying out stair stringers. These gauges will be found very convenient also for laying out rafters or calculating for miter or angle cuts. The manufacturers claim that by their use work may be accurately and rapidly laid out in fractions of inches. For rafter work one gauge may be set on the figure designating the rate of pitch, and the other gauge set to designate one-half the width of the building.



Showing Application of Trimo Square Gauge.

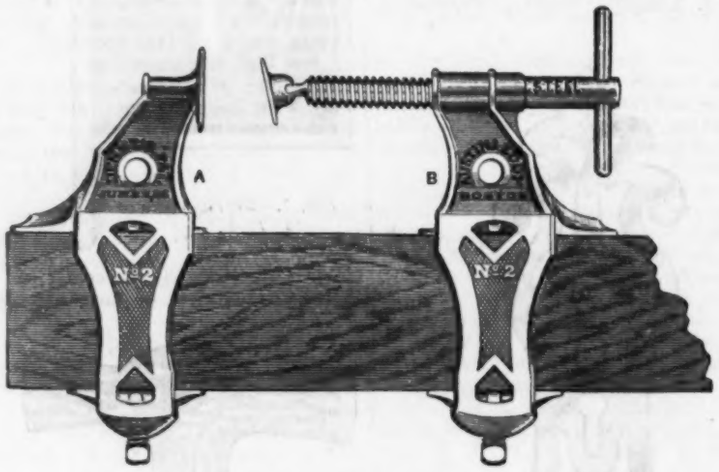
Zinc Bathtub.

The Cincinnati Stamping Company, of Cincinnati, Ohio, are offering the trade a new form of bathtub, under the title of "Popular Zinc Bathtub, 1890." They allude to this article as occupying but little room, and call attention to the fact that it is oval in shape, measuring 33 inches in hight by 30 inches from front to back and 25 inches across. The seat stands 12 inches high, the feet being well braced. A heavy zinc edge surmounts the top. The interior finish is of a delicate flesh color, while the exterior is attractively finished in green and gold, with appropriate decorations. The tub is made in but one size, and the manufacturers claim that it will be found very desirable for the purpose for which it is intended.

Zinc Bathtub.

Dehne's Automatic Beam Clamp.

Austin & Eddy, of 115–119 Broad street, Boston, Mass., are offering the trade what they are pleased to call Dehne's Automatic Beam Clamp, a device of especial interest to those engaged in the manufacture of furniture, sash and blinds, doors, pianos, and other work where glue constitutes an important factor. The complete clamp is represented in Fig 10 of the engravings, and is seen to be made of two castings, designated A and B respectively. The latter is securely held in position on the beam by means of a set screw clearly shown on the under side of the beam. The casting marked A is so arranged as to slide freely on the beam, and is held in any desired position and automatically locked by bringing slight pressure against its face. The castings are made of malleable iron, are inexpensive, efficient and durable. In place of casting A the firm can supply, if desired, a wooden toe block which is securely fastened to the beam by means of a screw. When this arrangement is provided the casting B is left so as to slide upon the beam, and may be locked at any distance from the toe block by pressing against the face of it. The clamp is made in three sizes, ranging in capacity from a beam 2¼ x ¾ inches in cross section to one 3¼ x 1¼ inches.



Dehne's Automatic Beam Clamp, Made by Austin & Eddy.

The Aurora Hammock Fixtures.

Richard W. Montross, Galien, Mich., is introducing novelties in hammock fixtures, illustrated herewith. Fig. 1 represents the Aurora hammock spreader and is described as being attached to the loops of the hammock by the small cord passing through the staples. This, we understand, holds the hammock firmly and prevents the wearing of the strands, and is also referred to as free from the objections found in the use of hooks, notches or similar devices. The small cord passing through the staples are metal tipped. The head rest, Fig. 2, is referred to as forming a complete and easy rest for the head and can be attached to the spreader at will.

Fig. 1.—Aurora Hammock Spreader.

The support rope, Fig. 3, has a movable tinned hook which is alluded to as being simplicity itself, being quickly and securely adjusted. We are advised that these goods combine many desirable features and are received with favor wherever introduced.

Fig. 2.—Aurora Hammock Head Rest.

Fig. 3.—Aurora Hammock Support Rope.

SOUTHERN MISCELLANY.

The Bay State Furnace Company, at Fort Payne, Ala., have contracted with A. G. Rarig, of Columbus, Ohio, for the construction of the furnace recently reported in this correspondence.

The iron property known as the Drusilla Ore Mine, near Lime Branch, Ga., has been bought by parties from Cedartown, who will begin work shortly.

The Georgia Beauxite Company, with a capital stock of $100,000, have been incorporated, at Louisville, Ky., by A. L. Blackman, C. B. Clover, Charles Parks and others, and will mine and ship mineral ores.

The manufacture of a patent ice cream freezer is a new industry at Charlotte, N. C.

The Walker ore beds, in Calhoun County, Ala., are being developed by the Jacksonville Mining and Mfg. Company.

The Warren Iron Works is the title of the new machine shop and foundry established at Warren, Ark., by a company, of which T. D. Wardlow was a leading promotor.

It is stated that machine shops will be built at Greenwood, S. C., by the Georgia, Carolina and Northern Railroad Company.

An annex, 80 x 30 feet, is to be added to the Ingram & O'Neill Machine Shops, at Huntington, W. Va.

A new company is said to be in negotiation for the purchase of the works of the Vehicle Spring Company, at Chattanooga, and if the negotiations are consummated, the capacity of the plant will be enlarged and new machinery added.

Interest in mineral development in Arkansas is on the increase. A stock company have recently been organized by C. B. Woodbury, L. J. Semonin and L. Hirsch, to develop iron ore lands.

Valuable iron ore deposits have been discovered in Chatham County, N. C., and will probably be developed.

An iron foundry will be opened at Winchester, Ky., by Patrick Quinn, of Newport.

A party of Asheville capitalists have taken options on 2000 acres of mineral lands, in the vicinity of Flat Creek, N. C., and may organize a development company. The price asked for the property is $100,000.

Parties from Ohio have been in Chattanooga during the past week negotiating with a view of establishing a rolling mill and nail works in that city.

In the vicinity of Llano, Texas, quite a considerable iron boom has broken out; 30,000 acres of valuable mineral lands have been secured by a company, of which Geo. M. Wakefield is a member, and the property will probably be developed. On another tract, in that vicinity, a mine of red hematite ore is being worked, while near by the Llano Mining and Milling Company, are pushing work upon their ore lands.

A tool works, machine shops and iron foundry are among new industries that are to be established at Piedmont, West Va.

Machine shops and round house are to be erected at Galveston, Texas, by the Gulf, Colorado, and Santa Fe Railroad Company.

The West Virginia Coal, Iron and Lumber Company, with a capital of $1,000,000, have been incorporated at Jonesboro, Tenn., to develop mineral properties and build a furnace.

The Attalla Iron Company, with $400,000 capital stock, intend building a furnace and rolling mill, at Attalla, Ala. This company is composed of New Orleans capitalists.

The Gadsden Bar and Sheet Iron Mills, of Gadsden, Ala., have been incorporated with a capital stock of $150,000. The incorporators are Col. Arthur J. Moore, Charles Hoefinghoff, John W. Rahn, Frank L. Pfaff, and Thomas Clifton, all of Cincinnati.

It is stated that the new rolling mill now being constructed at Anniston, Ala., is under contract to be completed and in operation before the middle of August. The engines are being built by Tod and Co., of Youngstown, Ohio, and the other machinery by the Lloyd Booth Company of that city. The building will be 176 x 210 feet, with an engine shed 20 x 50 feet. The works will contain 12 puddling furnaces, equeezer, two heating furnaces for the muck bars, and a full complement of rolls.

At Goodwater, Ala., 60 miles east of Birmingham, deposits of iron ore have been discovered, and a company have been formed to develop the property.

Out-croppings of magnetic iron ore, showing 64 per cent. of iron, have been found 15 miles north of Asheville, N. C. Investigation is being made for the vein, and options are being taken on large tracts of land.

A big aluminum project is on foot in Atlanta, Ga. M. Emmi, of that city, has discovered a new aluminum producing process which has been thoroughly tested in New York and elsewhere.

A number of Atlanta capitalists, in company with the discoverer, are preparing for the organization of a stock company to build and operate a plant with a capacity of 2000 pounds of aluminum per day.

The Birmingham Safe and Lock Works have recently passed into the hands of a new company, of which J. C. Kyle is president; J. M. Thompson, vice-president; B. A. Thompson, secretary. It is stated that $90,000 was the amount of the purchase money.

Machine shops will be erected at Armory, Miss., by the Kansas City, Memphis and Birmingham Railroad Company.

The Hervey Plow Company, Lumited, with a capital stock of $50,000, have been incorporated at Shreveport, La.

An 85 x 65 feet annex is being added to the machine shops of the Chattanooga Machinery Company.

An iron mine near Atlanta, Texas, is being opened by the Lone Star Iron Company, of Jefferson, Texas.

The Ronceverte Foundry and Machine Works, of Ronceverte, W. Va., have passed into the hands of J. W. Harris, E. C. Best, J. C. Dixon and others, who contemplate organizing a company. The capacity of the plant will be enlarged and new machinery added.

A foundry and machine shop will be established at Florence, S. C., by the Carolina Real Estate and Investment Company.

A new company recently incorporated in Baltimore, with a capital stock of $50,000, are the Ventilating and Motor Company, which will engage in the business of manufacturing and selling motors, blowers and ventilating fans. L. H. Durling and others are the incorporators.

Two iron furnaces and a rolling mill are to be established at Stevenson, Ala., with English money.

At Bridgewater, Ala., the American Fireproof Steel Car Company have been organized with a capital stock of $1,500,000. Plans for the plant have already been prepared, and call for the erection of two one-story brick buildings, each 80 x 300 feet; two two-story buildings, 80 x 150 feet; one two-story building, 48 x 100, and a half-dozen smaller buildings. The president of this company is John S. Long, of Louisville, Ky. F. H. Foster, of Florence, Ala., is general manager and vice-president, and R. C. Johnson, of Atlanta, Ga., is secretary.

The R. D. Coal Mfg. Company, of Newman, Ga., have recently enlarged their shops by building an addition 40 x 90 feet. They will put in $10,000 worth of new machinery for making engines and boilers. This addition of working machinery and shop room will more than double their present capacity and give employment to a large number of extra hands.

An agricultural implement works will be established at Pell City, Ala., by Williams & Williams, of Birmingham.

Galvanized iron works are to be a new enterprise at East Chattanooga.

The Jackson Foundry and Machine Works, with a capital stock of $30,000, have been incorporated at Jackson, Tenn., by J. C. Smith, Stephen Howes, N. H. White and others.

T. J. Hayes is president of the recently organized foundry and machine shops, of Trenton, Tenn., which have a capital stock of $25,000; the secretary is W. L. Elder.

A machine shop, 40 x 100 feet, and a blacksmith shop, 20 x 40 feet, are being built at Elkins, W. Va., by the West Virginia Central and Pittsburgh Railway Company.

On June 17 the town of Cumberland, Md., will vote on the proposition of the Baltimore and Ohio Railroad Company to remove their machine shops, now located at Martinsburg, Keyser, Piedmont and Connelisville, to Cumberland, under condition that the last named city will advance a loan of $150,000, to be employed in the building of machine shop, round houses and other necessary buildings.

A contract has been given to A. R. Coulter for the erection of machine shops at Americus, Ga., by the Savannah, Americus and Montgomery Railroad Company.

CONTENTS.

CURRENT HARDWARE PRICES.

MAY 28, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.

Domestic.....₱ doz $3.00, 33⅓%
Excelsior.....₱ doz $10.00.....50&10&2%
Washburn's Self-Locking.....30@20&10%

Ammunition.—

Caps, Percussion, ₱ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges—
Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting.....15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—
Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—
First quality, 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Star, Club, Rival and Climax brands, 33⅓&10&2%
Selbold's Comb. Shot Shells.....15&2%
I X L, 10 and 12 guage.....40&5&2%
"Special," 16 gauge.....30&10&5&2%
"Special," 10 and 12 gauge.....40&10&2%
Fowler's Pat.....$3.25
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.....65&2%

Shells Loaded—
Standard List.....40&10&10&5%

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up...	68¢	Dis.20&2
U.M.C.&W. R. A.—B. E., 9&10...	82¢	
U.M.C.&W. R. A.—B. E., 8.....	96¢	
U.M.C.& W.R.A.—B. E., 7.....	$1.10	
U.M.C.&W. R. A.—P. E., 11 up..	1.15	
U.M.C.&W. R. A.—P. E., 9&10..	1.50	
U.M.C.&W. R. A.—P. E., 8.....	1.70	
U.M.C.&W.R.A.—P. E., 7.....	1.80	
Eley's B. E., 11 up.		$1.75
Eley's P. E., 11@20.		2.80

Anvils.—

Eagle Anvils, ₱ ℔ 10¢.....15@15&5%
Peter Wright's.....10½¢
Armitage's Mouse Hole.....9½¢
Armitage's Mouse Hole, Extra.11½@11½¢
Trenton.....9½@10¢
Wilkinson's.....9½@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Douglass Mfg. Co.	70@70& 10%
Wm. A. Ives & Co.	
Humphreysville Mfg. Co.	
French, Swift & Co. (F. H. Beecher, P. S. & W. Co.	
Rockford Bit Company.	

Cook's, Douglass Mfg. Co.....55%
Cook's, N. H. Copper Co.50&10&50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₱ set, 32⅔ quarters, No. 5, $5; No. 30, $3.50..20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&5%
Snell's Jennings Pattern.....60%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits.....60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....10%
Cincinnati Bell-Hangers' Bits.....30%

Bit Stock Drills—
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood...40&10%
Cincinnati, for wood.....30&5%
Cincinnati, for metal.....40&10%

Expansive Bits—
Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ₱ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common.....₱ gross $2.75@$3.25
Diamond.....₱ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ₱ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Hollow Augers—
Ives.....
French, Swift & Co.....
Douglass'.....
} 33⅓@ 33⅓&10%
Bouney's Adjustable, ₱ doz $48...40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....30@30&5%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—

Awls, Sewing, Common ₱ gr $1.70, 35%
Awls, Should. Peg, ₱ gr $2.45, 40@40&10%
Awls, Pat. Peg...₱ gr 63¢.....40@40&10%
Awls, Shouldered Brad..2.70 ₱ gr.....35%
Awls, Handled Brad...$7.50 ₱ gr.....45%
Awls, Handled Scratch ₱ gr, $7.50.35&10%
Awls, Socket Scratch, ₱ doz, $1.50.25@30%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality	$8.00	$8.50
Others	7.50	8.0.

Note.—Jobbers often sell at lower prices than the above.

Axle Grease—See Grease, Axle.

Axles—

No. 1 4¼@5¢, No. 2 5½@6¼¢ } 3% cash
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....33⅓%
Over 10 sets.....33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—

Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₱ doz	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Bars.

Crow—
Cast Steel.....₱ ℔ 4¼¢
Iron, Steel Points.....₱ ℔ 3½¢

Basins, Wash—

Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82...50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%

Beaters, Egg, &c—

Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....20%
Dover.....₱ doz $1.50
National, ₱ doz $4.50.....33⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ doz $1.25
Rival (Standard Co.).....₱ doz $1.00
Duplex Extra Heavy (Standard Co.)....₱ doz $3.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50@$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $14.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Bells—

Cow—
Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky.....70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....₱ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Electric,
Wollensak's.....20%
Bigelow & Dowse.....20%
Taylor's.....20%

Hand—
Light Brass.....75 @ 75&10%
Extra Heavy.....65 @ 65&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe(Cone's Patent).....25&10@35%

Bellows—

Blacksmiths'.....60&5@65%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70&10%
Standard.....70&70&5%
Extra.....60&5@60&10%
N. Y. B. & P. Co., Carbon.....60@60&10%
N. Y. B. & P. Co., Diamond.....50@50&5%

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire.

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Ordinary Tackle, list May 20, 1889...50@50&10%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Bolts—

Carriage, Machine, &c.—
Com. list June 10, '84.....70&12½&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....75&10
Bolt Ends, list Jan. 1, 1890.....75&10

Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.K.Flush, Com'n " ....55&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
R. B. & W., Plow.....55%

Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84....80%

Borers, Tap.

Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10&3%
Clark's.....A.....33⅓&3%

Borax.....₱ ℔ 9½@10½¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.

Per ℔.....2½¢

Braces.—

American Bit Brace Co.:
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5%
Ball Braces, net.....$1.12 to $1.25¢
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 ;10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber's,
Nos. 5, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12....65&10@70%
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5@50&10%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods—See Wire.

Broilers—

Henis' Self-Basting. { Inch..... 9 10 9x11
Per doz...$4.50 5. 6.50

Buckets, Well.

Galvanized—
Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@$4.50
Whiting's Wired Top..₱ doz $4.00@.4.25

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers Butchers'.

Butts—

Brass—
Wrought Brass.....75&10@80¢
Cast Brass, Tiebout's'.....50%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned..
Loose Pin, Acorns, Japanned, Plated Tips.....
} .70&5@ 70&10%

Wrought Steel—
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
} .70&5@ 70&10%
Bronzed Wrought Butts.....50%

Calipers—See Compasses.

Calks, Toe—

Gautier.....₱ ℔ 5½@6¢
Dewicks (Burke).....₱ ℔ 5½@6¢

Can Openers—See Openers, Can.

Cards—

Horse & Curry.....10&10&10&10%
Cotton.....10&10&10%
Wool.....10&10&10%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—See Ammunition.

Casters—

Bed.....	Brass	55@55&10%
Plate.....	Others	60@60&10%
Shallow Socket.....		
Deep Socket.		40&10%
Yale Casters, list May, 1884.		30&10@40%
Yale, Gem.		60@60&5%
Martin's Patent (Phoenix).		45&10@50%
Payson's Anti-friction.		60@60&10%
Giant Truck Casters.		30%
Stationary Truck Casters.		50&10%
Socket Truck Casters.		50%

Cattle Leaders—See Leaders, Cattle.

Chain—

Trace, Wagon and Fancy Chains, List revised April 21, 1890.....50& 10@60%

American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$4.00	5.70	4.80	4.30	3.90	3.75	3.65	3.55

Less than cask lots, add ½@¾¢ ₱ ℔.
German Coil, list of June 20, 1887 50&10&5@60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter.....60&3%
Covert Traces.....35@3%
Covert Heel Chain.....50&3%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔ 5½¢
Jack Chain, Iron.....75&10&80%
Jack Chain, Brass.....75@75&10%

Chalk—

White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W.....
New Haven.....
Witherby.....
Mix.....
Ohio Tool Co.....
} ..75 @ 75&10
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....50@30&5%

Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to $
Buck Bros.....30%
Cold Chisels, ₱ ℔.....15@1½%

Chucks—

Bash Pat.....each, $8.00.....30%
Morse's Adjustable,each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30@5%
Syracuse, Bals Pat.....25%
Skinner's Pat. Drill Chucks.....30%
Skinner's Independent Lathe Chucks.40%
Skinner's Pat. Comb. Chuck.....40%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.

Tiffin Union No. 1, 5 gallon...$3.25 each
Tiffin Union No. 2, 7 gallon...$3.75 each
Tiffin Union No. 3, 10 gallon...$4 25 each

Clamps—

R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30@10%
Stearn's Adjustable Cabinet and Corner.....30@30@10%
Cabinet, Sargent's.....60@5&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co 40&10%
Eberhard Mfg. Co.....40&5@10&10%
Warner's.....40@10@40@10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....15%

Cleavers.

Butchers'.

Bradley's.....25@30%
L. & I. J. White.....20@5%
Beatty's.....40@40@5%
New Haven Edge Tool Co.'s.....40%
P. S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40@5%

Clips—

Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 55&5%
Superior Axle Clips.....60@5&70%
Norway, Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₩ lb, 5½¢
Steel Felloe Clips.....₩ lb, 5¢
Baker Axle Clips.....55%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.

Hardware list.....50&2%

Coffee Mills—See Mills, Coffee.

Collars, Dog, &c.

Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.

Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
Perfect.....50%

Compasses, Dividers, &c.—

Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord, Sash—

Common.....₩ lb 10@11¢
Patent, good quality.....₩ lb 13@13½¢
White Cotton Braided, fair...₩ lb 28@29¢
Common Russia Sash.....₩ lb 13½¢
Patent " " .....₩ lb 15¢
Cable Laid Italian Sash.....₩ lb 22@23¢
Indian Cable Laid " .....₩ lb 13¢
Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....28@30%
B Quality, Drab, 55¢.....31@33%
C Quality, White (only).....26½@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson—
Braided, White Cotton, 50¢...30@30&5%
Braided, Drab Cotton, 55¢....30@30&5%
Braided, Italian Hemp, 55¢...30@30&5%
Braided, Linen, 80¢.....30@30&5%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—

Table (H. & R. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—

Grain.....50&5&2@50&10&2%

Crayons.

White Crayons, ₩ gr, 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
M. Stewart Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins Curtain.

Cutters—

Meat.

Dixon's ₩ doz.....40&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$00.00

Woodruff's ₩ doz.....40&5%

Nos.	100	150
	$15.00	$18.00

Hales Pattern ₩ doz.....70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American.....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise.....30%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Pennsylvania.....40&10%

Nos.	1	2	3	00
₩ doz.	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ₩ doz.....45@45&10%

Nos.	1	2	3
	$32.00	$30.00	$40.00

Home No. 1.....₩ doz, $26.00, 55&10%
Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$80	$225

.....20@25%
Beef Shavers (Enterprise).....20&10@30%
Little Giant.....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00

Tobacco.

Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@$5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $20.00, 40%

Washer.

Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's, ₩ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Cutlery—

Beaver Falls & Booth's.....33⅓%
Wostenholme.....$7.75 to $

Dampers, &c—

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c —

Samson Post Hole Digger, ₩ doz $36.00, 25&10%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $16.00@17.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz. 15.00
Kohler' New Champion.....₩ doz. $9.00
Schniedler.....₩ doz. $18.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₩ doz $30.00, 50@
Imperial, ₩ doz $15.....45%

Dividers—

See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.

Money, ₩ doz.....$18&$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—

Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....50@20&5
Ratchet, Whitney's.....20&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action..25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85

Twist Drills—

Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits,—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans-See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....20@20&10%
Disston's.....4&10%
Disston's Pat. Excelsior.....45&10%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....55&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....60⅔&10& 0%
P. S. & W.....70 %
Knapp & Cowles No.1.....60&0&70%
No. 1 Extra.....60@30&10
Nos. 00 & 4.....50&5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....50%
Eilrich's Socket and Ratchet..25@25&.0%
Allaru's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00,25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....20&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits.....%

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.— No. 4 to No. 54 to Flour,CF

	46 gr.	150 gr.	P. FF.
Kegs, ₩ lb	4½¢	5 ¢	2½¢
½ kegs, ₩ lb	4¾¢	5½¢	2¾¢
¼ kegs, ₩ lb	5 ¢	5½¢	3 ¢
10-lb cans, 10 in case	6 ¢	6¼¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.

Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Fasteners, Blind—

Mackrell's, ₩ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Washburn's Old Pattern, ₩ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00

Faucets.—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $50.00.....20&10%
Lane's, ₩ doz $36.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—

Derby and Cincinnati.....50&5%
Brewster.....55&5%

Files—

Domestic—

Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands.....60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60& 10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%

Imported—

Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fixtures.

Grindstone—

Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—

Hay, Manure, &c., Asso List.....70%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Frames—

Saw—

White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%

Screen, Window and Door—

Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons..33⅓@33⅓&10%
Stearns' Frames and Corners..25@25&10%

Freezers, Ice Cream—

White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&5%
Shepard's Lightning.....65@65&5%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10
Keystone, P. D. & Co., each, $1.50.....20%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, *Fry.*

Funnels.

Gersdorff's Perfection, Standard and Globe: *Tin*, 1 gro., 10 %; 2 to 5 gro., 20 % ; 5 to 10 gro.....30 %
Copper, 1 to 6 doz., 15 % ; 6 to 12 doz., 20 % ; over 12 doz.....30 %

Fuse— ₩ 1000 ft

Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.35
Double Taped Fuse, for very wet gr. 4.35
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—

Stebbin's Pattern.....75@75&10%
Stebbin's Genuine.....60&10&10%
stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....20%
Lincoln's Pattern.....70@70&10%
Weed's.....20&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co 10%
Wire, Morse's.....50@50&5%
Wire, Brown & Sharpe's.....10@20%
Wire, P. S. & W. Co.....

Gimlets—

Nail and Spike.....50&10&5%
" Eureka " Gimlets.....40&10%
" Diamond " Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
" Bee," ₩ gr $12.....25@25&5%

Glue—

Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.

Fraser's.....Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs...₩ doz 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 35¢
Lower grades, special brands, ₩ gr $5.50@$7.00

Grindstones—

Small, at factory.....₩ ton $7.50@9.00

Grindstone Fixtures—See Fixtures, Grindstone.

Hack Saws—See Saws.

Hafts, Awl.

Sewing, Brass Fer. ₩ gr, $3.50.....45&10%
Pat. Sewing, Short. $1.00 ₩ doz.....40&10%
Pat. Sewing, Long.....₩ doz $1.20
Pat. Peg, Plain Top. ₩ gr $10.00...45&10%
Pat. Peg, Leather Top. ₩ gr $12.00.45&10%

Halters.

Covert's, Rope, ½-in. Jute..... 50&2%
Covert's, Rope, ½-in. Hemp .....50&2%
Covert's Adj. Rope Halters .....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%
Covert's Adj. Web Halters.....35&2 %

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.. ....25&10@35%
Buffalo Hammer Co.
Humason & Beckley
Atha Tool Co.
Fayette R. Plumb. } 50@50&10%
C. Hammond & Son.
Hartford Hammer Co.
Verree.
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....50&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%

Heavy Hammers and Sledges—

3 lb and under.....₩ lb 40¢ } 70@70&10%
3 to 5 lb.....₩ lb 36¢ }
Over 5 lb.....₩ lb 30¢ }
Wilkinson's Smiths.....10½¢@11¢₩ lb

Handcuffs and Leg Irons—See Police Goods,

Handles—

Cross-Cut Saw Handles—

Atkins' No. 1 Loop, ₩ pair, 28¢ ; No. 3 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢....60%
Champion.....15

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3
Per doz.	$0.90	1.00	1.18	1.35 1.50

60&10&10%

Roggin's Latches.....₱ doz 30@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.65; Plate, $1.10; no Plate, $0.88 ..... net
Barn Door, ₱ doz $1.40..... 10&10%
Chest and Lifting.....70%

Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd. ₱ gr 4.50
Hickory Firmer Chisel, large. ₱ gr 5.00
Apple Firmer Chisel, ass'd...₱ gr 5.00
Apple Firmer Chisel, large...₱ gr 6.00
Socket Firmer Chisel, ass'd...₱ gr 3.00
Socket Framing Chisel, ass'd. ₱ gr 5.00
} 40% dis
J. S. Smith & Co.'s Pat File.....50
File, assorted.....₱ gr 9 75
Auger, assorted.....₱ gr 5.00
Auger, large.....₱ gr 7.00
} 40& 40&10
Pat. Auger, Ives'.....30&10
Pat. Auger, Douglass.....₱ set $1.2[illegible]
Pat. Auger, Swan's.....₱ set $1.0[illegible]
Hoe, Rake, Shovel, &c.....5[illegible]10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....60%
Climax Anti-Friction for Wood Track55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10@60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50&5%
Wood Track Iron Clad, ₱ ft. 10¢.....50 &15@60%
Carrier Steel Anti-Friction.....50@50&5%
Architect, ₱ set $6.00.....20&10%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30@30&10%
Lane's Standard.....50&5@50&10%
Lane's New Standard.....50@5&5%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
Blood's
Hunt's
Hurd's
Mann's
Peck's
Underhill's
Buffalo Hammer Co.
Fayette R. Plumb.
C. Hammond & Son...
Kelly's
Sargent & Co.
P., S. & W. Co.
Ten Eyck Edge Tool Co.
} 40 & 10 @ 50&5 %
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Nicholson.....45&10%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@50%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible. ...70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50. .....25&2%

Gate Hinges—

Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic.....₱ doz $12.50, 50%
Common Sense.....₱ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%

Spring Hinges—

Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March, 886 .....20%
Acme.....30%
J. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Barker's Double Acting.....20&10%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Bardsley's Patent.....40%
Stearn's.....50&10%

Wrought Iron Hinges

Strap and T.....70&10%
Screw Hook and Strap. { 6 to 12 in., ₱ D. 4 2-10¢ / 14 to 20 in., ₱ D. 3 7-10¢ / 22 to 36 in., ₱ D. 3 2-10¢
Heavy Welded Hook. { 6 to 12 in., ₱ D. 4 2-10¢ / 14 to 20 in., ₱ D. 3 7-10¢ / 22 to 36 in., ₱ D. 3 2-10¢
Screw Hook and Eye { ⅝ in., ₱ doz $1.50 / ¾ in., ₱ doz $2.45 / ⅞ in., ₱ doz $3.80 } 10%
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges "Providence" { 8, 10 & 12 in., ₱ D.....5¢ / over 12 in., ₱ D. ...4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat. 60&5 @ 60&10%
Hubbard & Co.,S. & O. Pat.60&5@60&10%
Chattanooga Tool Co., S. & O. Pat.,60& 5@60&10%
Grub.....60@60&10%

Handled—

Garden, Mortar, &c.....70%
Planter's, Cotton, &c.....70%
Warren Hoe.....60%
Magic.....₱ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengie's Pat.....₱ doz $18.....60%

Bit.

Extension,
Barber's, ₱ doz $15.00.....40@40&10%
Ives, ₱ doz $20.00.....60&5@60&10%
Diagonal.....₱ doz $24.00, 40%
Angular.....₱ doz $24.00, 40&5%

File and Tool—

Bals Pat.....₱ doz $4.00; 25%
Nicholson File Holders..... 20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list.....
Bird Cage, Reading.....
Clothes Line, Sargent's list..
Clothes Line, Reading list. 60&10@60&10&10%
} 60&10&10%
Ceiling, Sargent's list..... 55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%

Wrought Iron—

Cotton.....₱ doz $1.25
Cotton Pat. (N.Y.Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....45%
Handy Hat and Coat.....50&10%
Steady Ceiling Hooks.....50&10%
Belt.....80@80&10%
Atlas, Coat and Hat.....60%

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks .....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition..... ...75&10@75&10&5%
Standard..... ...70@70&10%
Extra.....60@60&10%
N. Y. B. & P. Co., Para.....30&10%
N. Y. B. & P. Co., Extra.....50%
N. Y. B. & P. Co., Dundee.....60&10&5%

Huskers—

Blair's Adjustable.....₱ gr $8.00
Blair's Adjustable Clipper...₱ gr 7.00
Hubbard's Solid Steel.....₱ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....₱ 100 ℔, $2.30@$2.40
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'....₱ doz $18.00 net
Mrs. Pott's Irons.....40@40&10%
Enterprise Star Irons.....40@40&10%
Cold Handle Sad Irons .....40&10@50%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons.....35%
B. B. Sad Irons, ₱ ℔.....3 @3½¢
Combined Fluter and Sad Iron, ₱ doz. $15.00.....15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....8¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible.....20@20&5%
National Self-Heating.....30 %

Soldering—

Soldering Coppers.....₱ ℔ 22 @ 23¢
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy.....25%

Kettles— Spun. Stamped.
Brass, 7 to 17 in., ₱ ℔.... 24¢ 21 ¢
Brass larger than 17 in., ₱ ℔..... 26¢ 23½¢
Enameled and Tea—See Hollow-Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives.....25@30%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c..... ...40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives. ₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Corn—

Bradley's.....10%
Wadsworth's.....25%

Drawing—

Witherby.....
P. S. & W.....
Mix.....
New Haven.....
} ..75@ 75&10 %
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning..Mfrs'. price ₱ doz $18.00, 25% But jobbers cut this price freely, often selling at $8 @ $8.50.
Wadsworth's.....40@7½@40&10%
Carter's Needle.....₱ doz $11.00@$11.50
Heath's.....₱ doz $13.00@13.50
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₱ doz $8.00 @ $9.00

Mincing.

Am. (2d quality), ₱ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₱ doz $3.00 25%
Buffalo Double Adj'table.₱ doz $3.00 25%

Knobs—

Door Mineral.....60@65%
Door For. Jap'd.....70@75%
Door For. Nickel.....$2.00@2.25
Door For. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch. 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladles.—
Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...₱ doz $4.00, 40%
Melting, P. S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards....$4.00@4.25
Sq. Lift Wire, with Guards....$4.25@4.50
Without Guards, 25¢ ₱ doz less.

Miscellaneous.

Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%

Lawn Mowers—See Mowers, Lawn.

Leaders. Cattle.

Aumason. Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters. Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Aug. 1, 1889.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..,50%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes.. Nos. 12 16 20
100 ft. $4 00 $3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%

Locks, &c.—

Cabinet

Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan. 1, '85..33½&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓%
Yale.....net prices
Romer's.....35%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889..... } 60&10@60 &10&10
Mallory, Wheeler & Co., list July, '88..... } Much lower net prices often made.
Sargent & Co., list Aug. 1, '88 }
Reading Hardware Co., list Feb. 2, '88..... }
Brittan, Graham & Mathes, list Jan. 1890..... 60&10&10%
Perkins' Burglar Proof.....60&35%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deitz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock.....25%

Padlocks—

List Dec. 23, '84.....75@75&10%
Brittan, Graham & Mathes..... 75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz, $9. 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian: Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....60%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker Barry & Co.
No. 41 line.....45&5%
No. 81 line.....60&5%
No. 21 line.....75@5%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₱ gr..33⅓%
Ferguson's.....33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor.....60&10&5%
Walker's.....10%
Attwell Mfg. Co.....35&33⅓%
Reading.....60%&10@60%&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'sed.....₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Lieseke's, Nos. 100 and 110, ₱ gr $8; 105, $10.00.....20&10%
Davis, Bronze, Barnes Mfg. Co.... 50%
Champion Safety, list March 1, 1888 55@55&5%
Security.....70%
Buckeye.....₱ gro $4.80

Lumber Tools—See Tools, Lumber.

Lustre—

Four-ounce Bottles....₱ doz, $1.75; ₱ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75	50%
Snell's, Nice's Pat.	5.50	6.75	40&10&10
Jennings	5.50	6.75	45@45&10
Other Machines	2.25	2.75	
Phillips' Patent with Augers	7.00	7 50	

Pluting.

Knox, 4¼-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30 .....40%

Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter. ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo ..... ₱ doz $10.00.....10%

Hoisting—
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Differential Pulley Block...40%
Energy Mfg. Co's.....25%

Mallets.

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Mattocks. Regular list.....60&5%

Measures—

Standard Fiberware, No. 1, peck, ₱ dozen, $4; ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Mills.

Coffee—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10@30%
The Swift, Lane Bros.....20&10%

Mincing Knives—See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers—See Drawers, Money.

Mowers, Lawn.

Leading makers.....60@60&10&5%
Other makers.....60&10&5@60&10&10%
Pennsylvania.....60%
Continental.....60%
New Model.....60&10&5%
New Quaker City.....60&10&5%
Great American.....60&10&5%

Muzzles—

Safety.....₱ doz, $3.00, 25%

Nails.

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15,'89.70&10&10%
Tack M'frs.' list.....60&10&10%
Wire Nails, Standard Penny Card June 1, '89, base.....$2.35 @ $2.40

Horse—

Nos.	6	7	8	9	10
Ausable.....	.28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin.....10½ @ 11¢, net
Essex .....28¢ 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Lyra .....25¢ 23¢ 22¢ 21¢ 20¢.
40&10&5@50%
Snowden 25¢ 23¢ 22¢ 21¢ 20¢.
40&10&5@50%
Putnam.....23¢21¢ 20¢ 19¢ 18¢.
1000 ℔ in year 15%
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢..12½&2%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢.
25@25&5%
Globe.....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢.30&2½%
A. C.....25¢ 23¢ 22¢ 21¢ 20¢.
25&10@33½&5%
C. B.-K.....25¢ 23¢ 22¢ 21¢ 20¢.
25&10@33½&5%
Champlain .28¢ 6¢ 25¢ 24¢ 23¢. 6%&10%
New Haven..28 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion ...25¢ 23¢ 22¢ 21¢ 20¢.
10&10&10%
Capewell.....28¢ 26¢ 5¢ 24¢ 23¢.
35&5@35&10%
Star.....23¢ 21¢ ¢¢ 19¢ 18¢.
10&10&10&12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢...40&10%
Empire Bronzed.....14 ₱ ℔.

Picture—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—

Nuts, off list Dec. 18,1889:	Square.	Hex.
Hot Pressed	5.55¢	6.10¢
Cold Punched	5.10¢	5.00¢

In lots less than 100 ℔, ₱ ℔, add ½¢; 1-℔ boxes, add 1¢ to list.

Oakum—

Government.....₱ ℔ 7@7½¢
U. S. Navy.....₱ ℔ 6@6¼¢
Navy.....₱ ℔ 5¼¢@5½¢

Oilers—

Zinc and Tin.....65@65&10%
Brass and Copper .....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list.....40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Gem P. D. & Co.....₱ gro. $2
Steel, Draper and Williams.....50%

Openers, Can.

Messenger's Comet.....₱ doz $3.00, 25%
American.....₱ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....₱ doz $3.75, 20%
No. 4 French.....₱ doz $2.25, 55@60%
No. 5, Iron Handle.....₱ gr $6.00, 45@50%
Eureka.....₱ doz $2.50, 10%
Sardine Scissors.....₱ doz $2.75@3.00
Star.....₱ doz $2.75
Sprague, No. 1, $2.00 2, $2.25; 3, $2.50 50&10&10%
World's Best, ₱ gross, No. 1, $12.00 No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₱ doz $3.00.....35&5%
Domestic, ₱ doz $2.50.....40%
Champion ₱ doz $2.00.....50%

Packing, Steam—

Rubber—

Standard .....60&10@60&10&10%
Extra .....50&10@60%
N. Y. B. & P. Co., Standard ...50&10&5%
N. Y. B. & P. Co., Empire 70%
N. Y. B. & P. Co., Salamander.

Jenkins' Standard.....₱ ℔ 65¢, 30%
₱ ℔ 80¢, 35%

Miscellaneous—
American Packing.....10¢@11¢ ₱ ℔
Russia Packing .....14¢ ₱ ℔
Italian Packing .....13¢@14¢ ₱ ℔
Cotton Packing .....15¢@17¢ ₱ ℔
Jute.....7¢@8¢ ₱ ℔

Padlocks—See Locks.

Pails.

Galvanized Iron—

Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shephard & Co.	2.35	2.85	3.05
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—25%
Star Pails, 12 qt .....₱ doz $6.00
Wire, Stable and Milk, 14 qt ..₱ doz $7.80

Standard Fibre Ware—

	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt	6.50	7.50

Pans.

Dripping.
Small sizes.....₱ ℔ 6½¢
Large sizes.....₱ ℔ 5¾¢

Fry—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....70&10%
Acme Fry Pans .....60&10%

Paper and Cloth—

Sand and Emery—
List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....30%

Parers.

Apple.

Advance	₱ doz $4.75
Antrim Combination	₱ doz 5.50
Baldwin	₱ doz 5.25
Champion	₱ doz 7.25
Daisy	₱ doz 4.00
Eureka, 1888	each 17.00
Family Bay State	₱ doz 12.00
Favorite	₱ doz 5.00
Gem	₱ doz 5.25
Gold Medal	₱ doz 4.00
Ideal	₱ doz 4.00
Improved Bay State	₱ doz 30.00
Little Star	₱ doz 4.50
Monarch	₱ doz 13.50
New Lightning	₱ doz 5.50
Oriole	₱ doz 4.00
Penn	₱ doz 4.00
Perfection	₱ doz 4.00
Pomona	₱ doz 4.00
Rocking Table	₱ doz 6 00
Turntable	₱ doz 4.50
Victor	₱doz 13.50
Waverly	₱ doz 4.00
White Mountain	₱ doz 4.50
72	₱ doz 4.25
76	₱ doz 5.75
78	₱ doz. 6.50

Potato—
White Mountain .....₱ doz $5.00@5.50
Antrim Combination.....₱ doz $8.00
Hoosier.....₱ doz $13.50

Pencils—

Faber's Carpenters'..... high list 50%
Faber's Round Glit.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters' .....40&10%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60@60&5%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.

Bow—
Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....50&10%
Peck, Stow & W. Co.. 50&10&50&10&5%

Curtain—
Silvered Glass.....net
White Enamel.....net

Escutcheon,
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—

List September 18, 1889.

1¼ and under, Plain	47½%
1¼ and under, Galvanized	40%
1½ and over, Plain	60%
1½ and over, Galvanized	47½%

Boiler Tubes, Iron.
1¼ and under.....45%
2 to 4 inch.....50%
4-inch and larger.....52½%

Planes and Plane Irons—

Wood Planes—
Molding.....45&2%
Bench, First Quality.....55&2%
Bench, Second Quality.....60&2%
Bailey's (Stanley R. & L. Co.)..40&10%

Iron Planes—
Bailey's (Stanley R. & L. Co.)..... 40&10@40&10&10%
Miscellaneous Planes (Stanley R. & L. Co.) .....20&10@20&10&10%
Victor Planes (Stanley R. & L. Co.). ..... 20&10@20&10&10%
Steer's Iron Planes.....35@35&10%
Merrien Mal. Iron Co.'s.....40@40&10%
Davis's Iron Planes .....40@40&10%
Birmingham Plane Co.....50@50&10%
Gage Tool Co.'s Self-Setting.....20&10%
Chaplin's Iron Planes .....40@40&10%
Sargent's .....30&10@30&10&10%
Standard Tool Co.....50@50&5%

Plane Irons—
Butcher's.....$5.00@$5.25 to 2
Buck Bros 30%
Auburn "Thistle.....
Ohio..... } 35&2%
Sandusky.....
S. & I. J. White.....25%

Plates.

Feltoe .....₱ ℔ 6¢@6¼¢

Pliers and Nippers—

Button's Patent.....30&10@40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz .....20&10@33½%
Humason & Beckley Mfg. Co..50@50&10%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel.....25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—

Regular List .....70&10@70&10&10%
Disston's.....45&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers .....10&10%

Poachers.

Egg.
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Police Goods.

R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00: 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish, Metal.

Prestoline.....20&10%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Pokes, Animal—

Bishop's I. X. L.....₱ doz $6.00
Bishop's O. K.....₱ doz $5.25
Bishop's Pioneer.....₱ doz $3.75
Bishop's American.....₱ doz $2.75

Polish, Stove.

Joseph Dixon's.....₱ gro $6.00,-10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror .....₱ pro $6.00, —%
Lustro .....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots .....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ 8¢
Boynton's Noon Day, ₱ gro.....13.00
Parlor Pride Stove Enamel..₱ gro $ cans
Yates' Liquid, 2 3 5 10 gal....8¢ ₱ gal ...$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 15¢
Jet Black .....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans .....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans .....12½¢
Nickel Plate Paste .....₱ gro $6.00

Poppers, Corn—

Round or Square, 1 qt..₱ gr $10.00@10.50
Round or Square, 1½ qt..₱ gr $15@15.50
Round or Square, 2 qt..₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.

Glue—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Presses.

Fruit and Jelly—
Enterprise Mfg. Co.....20&10@30%
Henis.....₱ doz $2.50
Shepard's Queen City.....40%

Pruning Hooks and Shears.—See Shears.

Pullers.

Nail.
Curtiss Hammer.....₱ doz $9.00
Giant, No. 1.....₱ doz. $18.00, 10%
Giant, No. 2.....₱ doz, $15.00, 10%
Pelican.....₱ doz, $9.00, 25%

Pulleys—

Hot House, Awning, &c.....60&10%
Japanned Screw.....60&10%
Brass Screw.....60&10%
Japanned Side.....60&5&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55@60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00: Swivel, $4.50.....50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 .....50%
Hay Fork, "F" Common and Pat. Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating ...60%
Shade Rack.....45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00.....40

Pumps—

Cistern, Best Makers .....60@60&10%
Pitcher Spout, Best Makers....67½@70%
Pitcher Spout, Cheaper Goods.70@70&5%

Punches—

Saddlers' or Drive, good, ₱ doz....60@65%
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket.50&5%
Spring, good quality.....₱ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check ..40%
Solid Tinners', P.S.&W.Co., ₱ doz $1.44, 55%
Tin'rs' Hollow Punches P.S.&W.Co.20&2%
Rice Hand Punches 15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door. Wr't Brass, ₱ ℔ 35¢.....15%
Sliding Door, Bronzed Wr't Iron..₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door Light. In. ½ ¾ 1
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet....$2.15 2.70 3.25..net
Terry's Steel Rail, ₱ foot.....4½¢
Victor Track Rail, 7¢ ₱ foot.....50&2%
Carrier Steel Rail, ₱ foot.....4½¢
Moore's Wrought Iron.....25%

Rakes—

Cast Steel, Association goods 70%
Cast Steel, outside goods 60&10&10@70&5%
Malleable.....70@70&5%
Gibbs Lawn Rake.....$12.00, 50&15
Canton Lawn Rake..... $9.00, 50&10
Ft. Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00..... .....25%

Razor

J. R. Torrey Razor Co.....20%
Wostenholme and Butcher, $10.00 to £, 10%
Jordan's AA A1, list Nov. 1, 1889.....50%
Jordan's Old Faithful, list Nov. 1, '89.50%
Electric.....List net

Razor Strops—See Strops, Razor.

Rings and Ringers.

Bull Rings—
Union Nut Co.....55%
Sargent's.....66⅔&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70&10%
Peck, Stow & W. Co's..50&10@50&10&10%
Elfrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—
Top of the Hill Ringers.....₱ doz $2.00
Top of the Hill Rings.....₱ doz $1.25
Hill's Improved Ringers. . ..₱ doz $4.25
Hill's Old Style Ringers.....₱ doz $2.75
Hill's Tongs.....₱ doz $4.50
Hill's Rings.....₱ doz bxs $2.15@2.25
Perfect Rings.....₱ doz bxs $1.60@1.70
Perfect Ringers.....₱ doz $2.15@2.25
Blair's Hog Ringers.....₱ doz $2.25@2.50
Blair's Hog Rings.....₱ doz 96¢@$1.00
Champion Ringers..... ₱ doz $2.00
Champion Rings, Double.....₱ doz $2.25
Brown's Ringers.....₱ doz $2.00
Brown's Rings.....₱ doz $1.25@1.30

Rivets and Burrs—

Iron, list Nov. 17, '87.....40%
Copper.....50&10@60%
Coppered Iron, Be'tina Brand.....40%

Rivet Sets—See Sets.

Rods—

Stair, Brass.....25&2%
Stair, Black Walnut .. ..₱ doz 40¢

Rollers—

Barn Door, Sargent's list.....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller 70%

Rope—

Manufacturers' prices:

Manila...½ in. and larger	₱ ℔ 15 ¢
Manila	₱ ℔ 15½¢
Manila.....¼ and 5-16 in.	₱ ℔ 15½¢
Manila Tarred Rope.....	₱ ℔ 14½¢
Manila, Hay Rope.....	℔ 15 ¢
Sisal...½ inch and larger	₱ ℔ 12 ¢
Sisal .....⅜ in.	₱ ℔ 12½¢
Sisal.....¼ and 5-16 in.	₱ ℔ 12½¢
Sisal, Hay Rope.....	₱ ℔ 12 ¢
Sisal, Tarred Rope.....	₱ ℔ 11½¢
Sisal, Medium Lathe Yarn.	₱ ℔ 11 ¢
Cotton Rope	₱ ℔ 15@18¢ net
Jute Rope	₱ ℔ 7½¢

1½% for cash in 10 days.

Wire—
List May 1, 1886.
Iron.....30%
Iron, Galvanized.....27½%
Cast Steel.....35%

Rules—

Boxwood.....80&10&10@80&10&10&5%
Ivory.....50@50&10%
Starrett's Rules and Straight Edges, Steel.....25&10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—

Disston's Circular.....45@45a5%	Extras sometimes given by jobbers.
Disston's Cross Cuts.....45@45&5%	
Disston's Hand 25@25&5%	

Atkins' Circular Shingle and Heading ..... 50¢
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts ₱ foot 24@25¢
Atkins' Hollow Back X Cuts. ₱ foot 18¢
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw, with handles, ₱ foot 32¢
W. M. & C., Hand ..... 30&5@30&10%
W. M. & C., Champion X Cuts, Regular ₱ foot 24@26¢
W. M. & C. X Cuts, Thin Back ₱ foot 27¢@29¢
Peace Circular and Mill ..... 45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard ₱ foot 25¢
Peace Cross Cuts, Thin Back ₱ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢

Hack Saws—
Griffin's, complete ..... 40&10@50%
Griffin's Hack Saw, Blades ..... 40&10@50%
Star Hack Saws and Blades 25%
Eureka and Crescent 25%

Scroll—
Lester, complete, $10.00 ..... 25%
Rogers, complete, $4.00 ..... 25%
Barnes' Builders' and Cabinet Makers', $15 ..... 25%
Barnes' Scroll Saw Blades 35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Sets.

Awl and Tool.
Aiken's Sets, Awls and Tools, No. 20, ₱ doz $10.00 ..... 55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9 ..... 25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12, 2, $18 ..... 25%
Henry's Combination Haft ..... ₱ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50 ..... 70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 ..... 50&10%

Nail—
Square ..... ₱ gr., $4.00@$4.25
Round ..... ₱ gr. $3.25
Buck Bros. 27½%
Cannon's Diamond Point ..... ₱ gr., $12, 20%

Rivet.
Regular list ..... 50&10%

Saw—
Stillman's Genuine ..... ₱ doz $5.00@7.75, 40&5%
Stillman's Imita ..... ₱ doz $3.25@5.25, 40&5@40&10%
Common Lever ..... ₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00, 40&10@50%
Leach's No. 0, $8.00; No. 1, $15, 15@20%
Nash ..... 20&10@20&10&10%
Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer ..... 30&5%
Bemis & Call Co.'s Plate 10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine ..... $13.00, 50&10%
Aiken's Imitation ..... $7.00, 55&5%
Hart's Pat. Lever 20%
Disston's Star, ₱ No. 15, $5.50; 20& 10@20&10&10%
Atkin's Lever ..... ₱ doz No. 1, $6.00
Atkin's Criterion ..... ₱ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10%
Avery's Saw Set and Punch 50%
Chieftain H. R. Co.'s Superior ₱ doz $15, 50%

Scales—
Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161 ..... ₱ doz $6.75@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.20@2.30
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls ..... 30@30&10%
Riehle Bros.' Platform 40%

Scale Beams—See Beams, Scale.

Scissors, Fluting 45%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50 ..... 30&10%
Box, 1 Handle ..... ₱ doz $4.00, 10%
Box, 2 Handle ..... ₱ doz $6.00, 10%
Defiance Box and Ship ..... 20&10%
Foot ..... 50&10@60%
Ship, Common ..... ₱ doz $3.50 net
Ship, R. I. Tool Co. 10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—
Bench, Iron ..... 55&10@55&10&10%
Bench, Wood, Beech ..... ₱ doz $2.25
Bench, Wood, Hickory ..... 20&10%
Hand, Wood ..... 25&10@25&10&10%
Lag, Blunt Point, list Jan. 1, 1890 ..... 75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 ..... 75%
Bed ..... 25&5%
Hand Rail, Sargent's ..... 66⅔&10%
Hand Rail, H. & B. Mfg. Co. ..... 70&10@75%
Hand Rail, Am. Screw Co. 75%
Jack Screws, Millers Falls list ..... 50@50&5%
Jack Screws, P. S. & W. 35%
Jack Screws, Sargent ..... 60&10@60&10&5%
Jack Screws, Stearns' ..... 40@40&10%
Cork—
Humason & Beckley Mfg. Co. ..... 40&10@50%
Williamson's ..... 33⅓@33⅓&5%
Howe Bros & Hulbert 35%

Machine—
Flat Head, Iron 55%
Round Head, Iron 50%

Wood—
List March 1, 1889.
Flat Head Iron 50%
Round Head Iron 40%
Flat Head Brass 45%
Round Head Brass 35%
Flat Head Bronze 45%
Round Head Bronze 35%
Rogers' Drive Screws ..... Extra 5 @ 10 % often given. 60⅔%

Scroll Saws—See Saws, Scroll.

Scythe Snaths—See Snaths, Scythe.

Sharpeners, Knife.
Parkin s.
Applewood Handles ..... ₱ doz $6.00, 40%
Rosewood or Cocobolo. ₱ doz $9.00, 40%

Shaves, Spoke.
Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.) ..... 40&10%
Stearns' ..... 30&10%
Cincinnati ..... 25&10%

Shears—
American (Cast) Iron ..... 75&10@75&10&5%
Barnard's Lamp Trimmers ..... ₱ doz $3.75
Tinners' ..... 20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears 33⅓%
First quality C. S. Trimmers. 80@80&10%
Second quality C. S. Trimmers. 80&10@80&10&10%
Acme Cast Shears ..... 10&10%
Diamond Cast Shears 10%
Clipper ..... 10&10%
Victor Cast Shears ..... 75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Chicago Drop Forge & F. Co., Solid Steel Forged 60%
Clauss Shear Co., Japanned 70%
Clauss Shear Co., Nickeled, same list. 60%
Electric ..... List net

Pruning Shears and Hooks.
Disston's Combined Pruning Hook and Saw ..... ₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools 40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co. 60%

Tinners', &c.—
Shears and Snips (P. S. & W.) ..... 20@25%
Snips, J. Mallinson & Co. 33⅓%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888 ..... 50&10@60&5%
R. & E., list Dec. 18, 1885 ..... 55&20%
Corbin's list ..... 60&10&2%
Patent Roller ..... 60&10&2%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 ..... 60&2%
Moore's Anti-Friction 50%

Sliding Shutter—
R. & E. list Dec. 18, 1885 ..... 60&10&2%
Sargent's list ..... 60&10%
Reading list ..... 60&10&10%

Ship Tools—
L. & I. J. White ..... 20&5%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phoenix, at factory. $4.00

Mule—
Add $1 ₱ keg to above prices.

Ox, Wrought—
Ton lots ..... ₱ ℔ 9¢
1000 ℔ lots ..... ₱ ℔ 9½¢
500 ℔ lots ..... ₱ ℔ 10¢

Shot—
(Eastern prices 2¢ off, cash, 5 days.
Drop, ₱ bag, 25 ℔ $1.30
Drop, ₱ bag, 5 ℔ ..... .31
Buck and Chilled, ₱ 25-℔ bag 1.55
Buck and Chilled, ₱ 5-℔ bag ..... .36

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885 ..... 20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron ..... 50&10%
Griffith's C. S. ..... 60@60&10%
Griffith's Solid C. S. R. R. Goods 20%
Old Colony (Sanford Fork & Tool Co) 35%
St. Louis Shovel Co. ..... 20@20&7½%
Hussey, Binns & Co. ..... 15@25%
Hubbard & Co. ..... 30@20&7½%
Lehigh Mfg. Co. ..... 50&10%
Payne Pettebone & Son, list January, 1886 ..... 30%
Remington's (Lowman's Pat.) ..... 30&10@40%
Rowland's, Black Iron ..... 50&10%
Rowland's Steel ..... 60&5@60&10%

Shovels and Tongs—
Iron Head ..... 60&10@60&10&5%
Brass Head ..... 60&10&10%

Sieves—
Mann's Tin Rim ..... 50&25%
Buffalo Metallic, S. S. & Co. ..... 50&25%
Shaker (Barler's Pat.) Flour Sifters. ₱ doz $2.00; ₱ gr $21.60
Electric ..... ₱ gr $21.00
A. & W. Sifters ..... ₱ doz 2.00
Hunter's ..... ₱ doz $2.00
Smith's Adjustable Sifters ..... ₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	80¢	$1.00
Mesh 20, Nested, ₱ doz..	95¢	1.10
Mesh 24, Nested, ₱ doz..	$1.15	1.25

Skeins, Thimble—
Western list ..... 75&5@75&10%
Columbus Wrt. Steel, list Jan. 3, 1889 ..... 45&10%
Coldbrookdale Iron Co. 60%
Utica P. S. T. Skeins 60%
Utica Turned and Fitted 35%

Slates—
School, by case ..... 50@50&10%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.) 65%
Fitch's (Bristol) ..... 50&10%
Hotchkiss 10%
Andrews 50%
Sargent's Patent Guarded ..... 70&10&10%
German, new list ..... 40&10%
Covert ..... 50&2%
Covert, New Patent ..... 50&5&2%
Covert, New R. E. ..... 60&2%
Covered Spring ..... 60&10&10%

Snaths, Scythe.
List ..... 50&10@50&10&5%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.
Standard Fiberware—
Cuspidors, 8½-inch, ₱ doz., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list ..... 70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list ..... 70&10%
Buffalo S. S. & Co. ..... 33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers ..... 40, 15, 10&5%
C. Rogers & Bros ..... 40, 15, 10&5%
Rogers & Bro ..... 40, 15, 10&5%
Reed & Barton ..... 40&10%
Wm. Rogers Mfg. Co ..... 40, 15, 10, 5&5%
Simpson, Hall, Miller & Co. ..... 40, 15, 10&5%
Holmes & Edwards Silver Co. ..... 40, 15, 10, 5&5%
Holmes & Edwards Silver Co. 60%

Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver ..... 50&10&5%
No. 30 Silver Metal ..... 50&10&5%
No. 24 German Silver ..... 50&10&5%
No. 50 Nickel Silver 50%
No. 49 Nickel Silver ..... 50&10
German Silver ..... 50@50&5
German Silver, Hall & Elton ..... 50&5% cash
Nickel Silver ..... 50&5@50&10&5% cash
Britannia 60%
Boardman's Nickel Silver ..... 50&5% cash
Boardman's Britannia Spoons, case lots ..... 60&5% cash

Springs, Door.
Torrey's Rod, regular size ..... ₱ doz $1.30
Gray's, ₱ gr., $20.00 ..... 20%
Bee Rod ₱ gr., $20.00 ..... 20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30 ..... 40&10@50%
Gem (Coil), list April 19, 1886 ..... 10%
Star (Coil), list April 19, 1886 ..... 20%
Victor (Coil) ..... 60@60&10%
Champion (Coil) ..... 60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. %
Cowell's ..... No. 1, ₱ doz, $18.00; No. 2, $15.00 ..... 50%
Rubber, complete, ₱ doz, $4.50 ..... 55&10%
Hercules 50%
Shaw Door Check and Spring ..... 25@30@35%
Elliptic, Concord, Platform and Half Scroll ..... 60@60&5%
Cliff's Bolster Springs 25%

Squares—
Steel and Nickel-Plated ..... 80 &10%
Try Square and T Bevels ..... 60&10@60&10&10%
Disston's Try Square and T Bevels. 45&10%
Winterbottom's Try and Miter ..... 30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares 40%
Avery's Bevel Protractor 50%

Squeezers.
Fodder.—
Blair's ..... ₱ doz $2.00
Blair's "Climax" ..... ₱ doz $1.25

Lemon—
Porcelain Lined, No. 1 ..... ₱ doz $6.00, 25&30%
Wood, No. 2 ..... ₱ doz $3.00, 35%
Wood, Common ..... ₱ doz $1.70@1.75
Dunlap's Improved ..... ₱ doz $3.75, 20%
Sammis ..... No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz ..... 25&10%
Jennings' Star ..... ₱ doz $2.50
The Boss ..... ₱ doz $2.50
Dean's ..... Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant ..... 50@50&5%
King ..... 40&5%
Hotchkiss Straight Flash ..... ₱ doz $12.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.
Blind—
Barbed, ½ in. and larger ..... ₱ ℔ 7@7½¢
Barbed, ⅜ in. ..... ₱ ℔ 8@8½¢
Fence Staples, Galvanized. } Same price as B'rb Wire.
Fence Staples, Plain. } See Trd. Rep.

Steelyards ..... 40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods ..... 40@40&10%
Butterfield's Goods ..... 40@40&10%
Lightning Screw Plate ..... 35@30%
Reece's New Screw Plates ..... 33⅓&5@40%
Reversible Ratchet ..... 30 %
Gardner 25%

Stops, Bench.
Morrill's ..... ₱ doz $9, 50%
Hotchkiss's ..... ₱ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's ..... ₱ doz $3. ..... 10%
Cincinnati ..... 25&10%

Stone—
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone ..... ₱ ℔ 2½¢
Washita Stone, Extra ..... ₱ ℔ 20@21¢
Washita Stone, No. 1 ..... ₱ ℔ 15&16¢
Washita Stone, No. 2 ..... ₱ ℔ 11@12¢
Washita Slips, No. 1, Extra ..... ₱ ℔ 37@40¢
Washita Slips, No. 1 ..... ₱ ℔ 25@26¢
Arkansas Stone, No. 1, 4 to 6 in ₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in ₱ ℔ $1.85
Turkey Oil Stone, 4 to 8 in. ..... ₱ ℔ 40¢
Turkey Slips ..... ₱ ℔ $1.00@1.50
Lake Superior, Chase ..... ₱ ℔ 16¢
Lake Superior Slips, Chase ..... ₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand ..... ₱ ℔ 18@20¢
Seneca Stone, High Rounds ..... ₱ ℔ 20@25¢
Seneca Stone, Small Whets ..... ₱ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.
Cast Steel, Polished ..... ₱ doz $2.25
Cast Iron, Steel Points ..... ₱ doz 80¢
Socket ..... ₱ doz $1.75
Millard's ..... 25@25&10%

Strops, Razor—
Genuine Emerson ..... 60@60&5%
Imitation " ..... ₱ doz $2.00, 20@10&5%
Torrey's 20%
Badger's Belt and Com ..... ₱ doz $2.00
Lamont Combination ..... ₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89. 50%
Electric ..... List net

Stuffers or Fillers, Sausage—
Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry ..... ₱ doz, No. 1, $15.00; No. 0, $21.00 ..... 50&5@50&10%
Draw Cut No. 4, each $30.00 ..... 20%
Enterprise Mfg. Co. ..... 20&10@30%
Silver's ..... 40&10%

Sweepers, Carpet.
Bissell No. 5 ..... ₱ doz $17.00
Bissell No. 7 New Drop Pan. ₱ doz $19.00
Bissell, Grand ..... ₱ doz $36.00
Grand Rapids ..... ₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic ..... ₱ doz $15.00
Jewel ..... ₱ doz $17.00
Improved Parlor Queen, Nickeled ..... ₱ doz $27.00
Japanned ..... ₱ doz $24.00
Excelsior ..... ₱ doz $22.00
Garland ..... ₱ doz $18.00
Parlor Queen ..... ₱ doz $24.00
Housewife's Delight ..... ₱ doz $15.00
Queen ..... ₱ doz $16.00
Queen, with band ..... ₱ doz $18.00
King ..... ₱ doz $30.00
Weed, Improved ..... ₱ doz $18.00
Hub ..... ₱ doz $16.00
Cog-Wheel ..... ₱ doz $16.00
Conqueror ..... ₱ doz $22.00
Easy ..... ₱ doz $22.00
Monarch ..... ₱ doz $22.00
Goshen ..... ₱ doz $21.00
Advance ..... ₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00; No. 2 ..... ₱ doz $16.00
American ..... ₱ doz $15.00
Grand Republic ..... ₱ doz $35.00

Tacks, Brads, &c.—
List Oct. 19, 1889.
Carpet Tacks—
American Iron, Blued 70%
American Iron, Tin'd or Cop'd. 70%
Steel, Plain or Bright 70%
Steel, Tinned or Coppered 70%
Swedes Iron, Blued 70%
Swedes Iron, Tinned or Cop'd 70%
American Iron Cut Tacks 67½%
Swedes Iron Upholst'rs' Tacks, S. S. 70%
Swedes Iron Upholsterers' Tacks, Tinned, S. S. 70%
Swedes Iron Card and Upholsterers' Tacks, Lanc. 66⅔%
Swedes Iron Card and Upholsterers' Tacks, Tinned, Lanc. 66⅔%
Gimp and Lace Tacks Lanc., Swedes Iron. 66⅔%
Gimp and Lace Tacks, Lanc., Swedes Iron, Tinned 66⅔%
Gimp and Lace Tacks, S. S. 70%
Gimp and Lace Tacks Tinned, S. S. 70%
Swedes Iron Basket or Trimmers' Tacks, Lanc. 66⅔%
Miners' Tacks, S. S. 70%
Bill-Posters' or Railroad Tacks, Lanc., Swedes 66⅔%
Bill-Poster's' or Railroad Tacks, S. S. 70%
Copper Tacks 50%
Copper Finish. & Trunk Nails 50%
Cigar Box Nails 50%
Zinc Glaziers' Points 50%
Picture-Frame Points 50%
Looking-Glass Tacks 50%
Brush Tacks 50%
Tin-Capped Trunk Nails 60%
Finishing Nails 65%
Trunk and Clout Nails, Black and Tinned 66⅔%
Common and Patent Brads 60%
Hungarian Nails 62½%
Basket and Chair Nails 62½%
Leathered Carpet Tacks 40%
Miscellaneous—
Double-Pointed 82½%
Wire Carpet Nails ..... 50&10%
Plymouth Rock Steel Carpet Tacks. 25%

Extra 10%@10&2½% cash.

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—See Borers, Tap.

Tapes, Measuring—

American.....33⅓@33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale—Steel

Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.

Coopers'—
Bradley's.....20%
Barton's.....30@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%
Lumber.
Ring Peavies, "Blue Line"...₱ doz $20.00
Ring Peavies, Common.....₱ doz $18.00
Steel Socket Peavies.....₱ doz $21.00
Mall. Iron Socket Peavies....₱ doz $19.00
Cant Hooks, "Blue Line"..₱ doz $16.00
Cant Hooks, Common Finish..₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $8.00; 14 ft. $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₱ doz $18.00
Saw.
Atkins' Perfection.....₱ doz $12.00
Atkins' Excelsior.....₱ doz $6.00
Atkins' Giant.....₱ doz $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters—See Lifters, Transom.

Traps—

Game—
Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

Mouse and Rat—
Mouse Wood, Choker, ₱ doz holes, 11@12¢
Mouse, Round Wire.....₱ doz $1.50, 10%
Mouse, Cage, Wire.....₱ doz $2.50, 10%
Mouse, Catch-'em-alive....₱ ds $2.50 15%
Mouse, Bonanza.....₱ gr $10.00
Mouse Delusion.....₱ gr $10.00@$12.00
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz., 90¢; in full cases, ₱ doz.....75¢
Hotchkiss Imp. Rat Killer...₱ gro $18.50
Hotchkiss New Rat Killer...₱ gro $16.50
Schuyler's Rat Killer.....₱ gro $15.00

Trowels—

Lothrop's Brick and Plastering.....20¢10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Peace's Plastering.....25%
Clement & Maynard's.....30%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—

Butter and cheese.....25%

Trimmers, Spoke.

Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'.....₱ doz $9.00, 20%
Cincinnati.....25%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ½ ℔ Balls	26¢	34¢
No. 12, ¼ and ½ ℔ Balls	25¢	33¢
No. 18, ¼ and ½ ℔ Balls	22¢	32¢
No. 24, ¼ and ½ ℔ Balls	22¢	32¢
No. 36, ¼ and ½ ℔ Balls	20¢	31¢

No. 264, Mattrass, ¼ and ½ ℔ Balls.52@54¢
Chalk Line, Cotton, ½ ℔ Balls.....25¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....15¼¢
3-Ply Hemp, 1 ℔ Balls.....16¢@16¼¢
3-Ply Hemp, 1¼ ℔ Balls.....15¢@15¼¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@16¢
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls.....10¢
Wool.....6¼¢@6¾¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—

Solid Box.....50&10@50&10&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....60⅓&10%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....20&10%

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.

Cast Iron, Hollow—
Stove Hollow-Ware—
Ground.....55&5@60&5%
Unground.....65&10@65&10&5%
White Enameled-Ware—
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Tinned Boilers and Saucepans.....40&5%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Enameled—
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%
Kettles—
Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.	$2.00	$2.25
Wash-Basins, 12 in.	2.25	2.75
Keelers, 11¼ in.		4.00
Cuspidors		5.00
Spittoons, "Daisy," 8 in.	4.00	4.50
Peck Measure	4.00	
Half-peck Measure	3.50	

See also Pails.
Indurated Fiber—25%
Spittoons, No. 2, ₱ doz.....$9.00
Basins, Ringed, ₱ doz., No. 1, $4.80; No. 2, $4.20; No. 3.....$3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₱ set.....$4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set.....$3.00
See also *Pails.*
Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.
Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....} 40&5%
Rogers & Brother.....
Hartford Silver Plate Co.....
William Rogers Mfg. Co.....} 40&5&5%

Washers—

Size.....	½	5-16	⅜	½	⅝	¾	1
Washers....	6½	5½	4½	3¾	3	3	3

In lots less than 200 ℔, ₱ ℔, add ¼¢, 5-lb boxes 1¢ to list.

Wedges—

Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 4 ¢

Weights, Sash—

Solid Eyes.....₱ ton $18@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.

8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire and Wire Goods—

Iron—
Market.
Br. & Ann., Nos. 0 to 18.....
Cop'd, Nos. 0 to 18.....
Galv., Nos. 0 to 18.....
Tin'd, Tinned list Nos. 0 to 18.} See Trade Report
Stone,
Br. and Ann'd, Nos. 16 to 18....67½%
Bright and Ann'd, Nos. 19 to 26.67½&5%
Br. and Ann'd, Nos. 27 to 36....70&10%
Tinned.....67½%
Tinned Broom Wire.....67½@67½&5%
Galvanized Fence.....55%
Annealed Fence, Nos. 8 and 9.....65%
Annealed Grape, Nos. 10 to 14.....65%
Brass, list Jan. 18, 1884.....25%
Copper, list Jan. 18, 1884.....25%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Malin's Steel and Tin'd on Spools.....50%
Malin's Brass and Cop. on Spools.....40%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $2.30
Steel Music Wire, Nos. 13 to 30..55¢ ₱ Picture Wire.....New list 50%
Barb Wire Safety Guards, ₱ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.
Bright Wire Goods—
Standard list.....35%
Wire Cloth and Netting.
Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.60 @ $1.75
Galvanized Wire Netting.....70&10@75%

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....40%
Baxter's Adjustable "S"....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&2%
Coes' "Mechanics".....50&10&2%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard...70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....} 75@75&10
Lamson & Sessions' Agric'l..
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&2%
Walker's.....55&2%
Diamond Steel.....55&2%
Cincinnati Brace Wrenches.....15&10%
Cincinnati Monkey Wrenches.....15&10%
Tafts' Vise Wrench.....55&10&3%

Wringers, Clothes—

List March 11, 1889, 2% cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1886, 80&15@85%

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw..per gal.	62	@	64
Linseed, City, boiled.....	64	@	66
Linseed, Western, raw.....	..	@	60
Lard, City, Extra Winter..	..	@	54
Lard, City, Prime.....	52	@	53
Lard, City, Extra No. 1.....	47	@	50
Lard, City, No. 1.....	42	@	45
Lard, Western, prime.....	..	@	53
Cotton-seed, Crude, prime.	33	@	..
Cotton-seed, Crude, off grades.....	30	@	32
Cotton-seed, Summer Yellow, prime.....	37	@	37½
Cotton seed, Summer Yellow, off grades.....	32	@	36
Sperm, Crude.....	65	@	67
Sperm, Natural Spring.....	6	@	69
Sperm, Bleached Spring....	72	@	74
Sperm, Natural Winter.....	74	@	77
Sperm, Bleached Winter...	79	@	82
Whale, Crude.....	40	@	45
Whale, Natural Winter.....	47	@	48
Whale, Bleached Winter...	50	@	51
Whale, Extra Bleached.....	54	@	55
Sea Elephant, Bleached Winter.....	58	@	60
Menhaden, Crude, Sound...	23	@	25
Menhaden, Crude, Southern	..	@	..
Menh den, Light Pressed..	26	@	27
Menhaden, Bleached W'ter.	30	@	31
Menhaden, Extra Bleached	35	@	36
Tallow, City, prime.....	..	@	46
Tallow, Western, prime....	..	@	..
Cocoanut Ceylon.....	..	@	6
Cocoanut, Cochin.....	..	@	5¾
Cod, Domestic.....	31	@	32
Cod, Foreign.....	33	@	34
Red Elaine.....	31	@	34
Red Saponified.....₱ ℔	4½@		4½
Bank.....per gal	25	@	26
Straits.....	27	@	28
Olive, Italian, bbls.....	80	@	85
Neatsfoot, prime.....	62½@		75
Palm, prime, Lagos....₱ ℔	5¾@		6

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test.....per gal	8	@	9
Black, 29 gravity, 15 cold test.....	8½@		9½
Black, 29 gravity, summer.	6	@	7
Cylinder, light, filtered....		@	20
Cylinder, dark, filtered....	14	@	20
Cylinder, dard, st'm refined	10	@	18
Paraffine, 23½ @ 24 gravity.	11	@	12
Paraffine, 25 gravity.....	10	@	11
Paraffine, 28 gravity.....	8½@		9
Paraffine, red. 21 @ 22 gr'ty	14	@	14½
Paraffine, red, 22½@23 gr'ty	12	@	13

Paints and Colors.

Barytes, Prime White.....			
	₱ ton. $22.00	@	22.50
Barytes, Amer. refined...20.00		@	....
Barytes, Amer. No. 1.....18.00		@	....
Barytes, Amer. No. 2.....16.00		@	....
Barytes, Amer., off-color.13.00		@	15.00
Blue, Celestial.....₱ ℔	5½@		7½
Blue, Chinese.....	45	@	50
Blue, Prussian.....	20	@	35
Blue, Ultramarine.....	7	@	25
Brown, Spanish.....	½@		1
Brown, Vandyke, Amer..	3	@	3½
Brown, Vandyke, English	6	@	8
Black, American Drop....	8	@	10
Black, English Drop.....	12	@	14
Black, Frankfort, Drop...	5	@	18
Black, Lamp, common...	12	@	18
Black, Lamp, medium....	19	@	25
Black, Lamp, prime.....	27	@	33
Carmine, No. 40, in bulk. 3.10		@	..
Carmine, No. 40, in boxes or barrels..... 3.20		@	..
Carmine, No. 40, in ounce bottles..... 4.20		@	..
Chalk, in bulk.....₱ ton. 2.75		@	3.00
Chalk, in bbls.₱ 100 ℔	30	@	35
China Clay, English....			
₱ ton. 13.50		@	18.00
China Clay, Southern...10.00		@	11.50
Cobalt Oxide, prep'd.... 2.90		@	....
Cobalt Oxide, black.. .... lots 100 ℔. 3.60		@	....
Cobalt, Oxide, black..... less 100 ℔. 2.65		@	....
Crocus Martus, Engl.₱ ℔.	1½@		2¼
Crocus, American	1½@		2½
Green, Paris, in bulk.....	14	@	14½
Green, Paris, 170 @ 175 ℔ kegs.....	14½@		15
Green, Paris, small pack.	16	@	21
Green, Chrome, ordinary	8	@	13
Green, Chrome, pure....	22	@	25
Lead, Eng., B.B. white....	9	@	1o
Lead, Amn. White, dry in bbls		@	6¾
Lead, Amn. White, dry, in kegs		@	7¼
Lead, Amn. White, in oil, keg lots 500 ℔.....		@	7¼
Lead, White, in oil, 25 ℔ tin pails.....		@	7¾
Lead, White, in oil, 12½ ℔ tin pails.....		@	8¼
Lead, White, in oil, 1 to 5 ℔ assorted tins.....		@	9¾
Lead, Red, pkgs. 500 ℔.....		@	7
Lead, Red, kegs.....		@	7¼
Litharge (pow'd), kegs.....		@	7¼

TERMS, &C.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice. Rebates, payable June 30 and December 31, if quantities specified are taken prior to those dates: To buyers of 3 tons and less than 10 tons, 4 %; 10 tons and less than 25 tons, 6%; 25 tons and less than 50 tons, 8%; 50 tons and upward, 10%.

Ocher, Rochelle..... 1.35		@	1½
Ocher, French Washed.....	1½@		2½
Ocher, German Washed...	1½@		3
Ocher, 'American.....	½@		1½
Orange Mineral, English...	8½@		9½
Orange Mineral, French....	9	@	9¾
Orange Mineral, German ..	8½@		9½
Orange Mineral, American.	8	@	8½
Paris White, English Cliff-stone.....	90	@	1.10
Paris White, American.....	70	@	80
Red, Indian, English.....	5½@		7
Red, Indian, American....	2	@	6
Red, Turkey	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American.. ₱ 10½ ℔.	90	@	1.25
Red, Venetian, English.... 1.00		@	1.45
Sienna, Italian, Burnt and Powd.₱ ℔	5	@	6¼
Sienna, Ital., Burnt Lumps	1½@		3½
Sienna, Ital., Raw, Powd..	5	@	6½
Sienna, Ital., Raw Lumps..	2	@	3½
Sienna, American, Raw....	1½@		1¾
Sienna, American, Burnt and Powdered.....	1½@		1¾
Talc, French.....	1½@		1½
Talc, American.....	1	@	1¼
Terra Alba, Fr'ch. ₱ 100 ℔	72½@		80
Terra Alba, English	80	@	85
Terra Alba, American No.1	70	@	75
Terra Alba, American No.2	38	@	40
Umber, Turkey, Bnt. and Powd.,.. ....₱ ℔	3½@		4
Umber, Turkey Bnt.Lm	2½@		3
Umber, Turkey, Raw and Powdered.....	3½@		
Umber, Turkey, R'w Lmps	2½@		2¾
Umber, Turkey, Bnt. Amer.	1½@		1¾
Umber, Turkey, R'w Amer.	1½@		1¾
Yellow, Chrome.....	10	@	25
Vermilion, Americ. Lead..	11½@		13
Vermilion, Quicks'er, bulk.	70	@	—
Vermilion, Quicks'er, bags.	71	@	—
Vermilion, Quicksilver, smaller pkgs.....	75	@	..
Vermilion, English Import	82	@	85
Vermilion, Imitation, Eng.	8	@	25
Vermilion, Trieste.....	75	@	77
Vermilion, Chinese.....	88	@	90
Whiting, Common.₱ 100 ℔	40	@	45
Whiting, Gilders'.....	50	@	55
Zinc, American, dry....₱ ℔	3½@		4½
Zinc, French, Red Seal....	..	@	7½
Zinc, French, Green Seal..	..	@	7½
Zinc, French, V. M. X....	6	@	6½
Zinc, Antwerp, Red Seal...	..	@	6½
Zinc, Antwerp, Green Seal	..	@	7½
Zinc, German, L. Z. O....	..	@	6½
Zinc, V M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10½@		10¾
lots less than 1 ton	10½@		11
Zinc, V. M. in Poppy Oil, Red Seal.....	..	@	..
lots of 1 ton and over....	9½@		10
Lots of less than 1 ton....	9¾@		10¼

DISCOUNTS.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades. 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese .....₱ ℔	35	@	40
Blue, Prussian.....	20	@	45
Blue, Ultramar.ine.....	12	@	18
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	15	@	18
Sienna, Raw.....	7	@	13
Sienna, Burnt.....	7	@	13
Umber Raw.....	7	@	10
Umber, Burnt	7	@	10

Glue.

Low Grade.....₱ ℔	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	9	@	20
English.....	10	@	15
Irish.....	12	@	15

CURRENT METAL PRICES.

MAY 28, 1890.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
⅜ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.	₩ lb 2 00 @ 2.10¢
Refined Iron:	
⅜ to 2 in. round and square.. 1 to 4 in. x ⅜ to 1¼ in. 4½ to 6 in. x ⅜ to 1 in.	₩ lb 2.20 @ 2.30¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.40 @ 2.50¢
Rods—⅜ and 11-16 round and sq.	₩ lb 2.30 @ 2.40¢
Bands—1 to 6 x 3-16 to No. 12	₩ lb 2.50 @ 2.60¢
"Burden Best" Iron, base price	₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price	₩ lb 2 80 @ ....¢
"Ulster"	₩ lb 3.00 @ ....¢
Norway Bars	4.00 @ ....¢
Norway Shapes	5.00 @ ....¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16	₩ lb 3.00	@ 3.00¢	3.50	@ ....¢
17 to 20	₩ lb 3.25	@ 3.25¢	3.50	@ 3.75 ¢
21 to 24	₩ lb 3.35	@ 3.35¢	3.75	@ ....¢
25 and 26	₩ lb 3.45	@	3.75	@ ....¢
27	₩ lb 3.55	@ 3.63¾¢	4.00	@ ....¢
28	₩ lb 3.75	@ ... ..¢	4.25	@ ....¢
	B. B.		2d qual.	
Galv'd, 14 to 20,	₩ lb. 5.00	@ ...	4.75½	@ ....¢
Galv'd, 21 to 24,	₩ lb, 5.37½	@ ...	5.12½	@ ....¢
Galv'd, 25 to 26,	₩ lb, 5.75	@ ...	5.50	@ ....¢
Galv'd, 27	₩ lb, 6.12½	@ ...	5.85½	@ ....¢
Galv'd, 28	₩ lb, 6.50	@ ..	6.23	@ ..¢
Patent Planished	₩ lb A 10¢		B, 9¢	
Russia	₩ lb 9½¢	@ 10¢		
American Cold Rolled B. B.	₩ lb 5¢	@ 7¢		
Craig Polished Sheet Steel	₩ lb, 8¼¢			

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢
R. Mushet's "Special"	₩ lb 45 ¢
" " "Titanic"	₩ lb 20 ¢

METALS.

Tin.

	Per lb
Banca, Pigs	23 ¢
Straits, Pigs	22 ¢
English, Pigs	22½¢
Straits in Bars	24½¢

Tin Plates.

	Charcoal Plates.—Bright.		Per box.
Melyn Grade	IC, 10 x 14	....	@ $6.25
" "	IC, 12 x 12	....	@ 6.50
" "	IC, 14 x 20	....	@ 6.25
" "	IC, 20 x 28	....	@ 12.75
" "	IX, 10 x 14	....	@ 7.75
" "	IX, 12 x 12	....	@ 8.00
" "	IX, 14 x 20	....	@ 7.75
" "	IX, 20 x 28	....	@ 15.50
" "	DC, 12½ x 17	..	@ 5.75
" "	DX, 12½ x 17	....	@ 7.25
Calland Grade	IC, 10 x 14	....	@ 6.25
" "	IC, 12 x 12	....	@ 6.50
" "	IC, 14 x 20	....	@ 6.15
" "	IX, 10 x 14	....	@ 7.40
" "	IX, 12 x 12	....	@ 7.65
" "	IX 14 x 20	....	@ 7.40
Allaway Grade	IC, 10 x 14	....	@ 5.35
" "	IC, 12 x 12	....	@ 5.50
" "	IC, 14 x 20	....	@ 5.35
" "	IC, 20 x 28	....	@ 10.75
" "	IX, 10 x 14	....	@ 6.50
" "	IX, 12 x 12	....	@ 6.65
" "	IX, 14 x 20	....	@ 6.50
" "	IX, 20 x 28	....	@ 13.25
" "	DC, 12½ x 17	....	@ 5.00
" "	DX, 12½ x 17	6.00	@ 6.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20	....	@	$5.12½
10 x 20	....	@	7.25
20 x 28	....	@	10.25
IX, 10 x 14, 14 x 20	....	@	6.00
BV Grade.—IC, 10 x 14, 14 x 20	....	@	4.87½

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20	....	@ $5.00
20 x 28	....	@ 10.00
IX, 14 x 20	....	@ 5.80
20 x 28	....	@ 11.60
Abecarne Grade.—IC, 14 x 20	....	@ 4.85
20 x 28	....	@ 9.87
IX, 14 x 20	....	@ 5.8
20 x 28	....	@ 11.60

Tin Boiler Plates.

I C X, 14 x 26	112 sheets	$13.00 @ $13.00
I C X, 14 x 28	112 sheets	@ 13.25
I C X, 14 x 31	112 sheets	@ 14.75

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem

Ingot.

Lake	@ 15¾¢
Baltimore Grade	@ 15¾¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	31	....	....	....	....
84	96		23	24	29	33	....	....	....	....
84		96	24	25	30	35	....	....	....	....
Over 84 in. wide			25	27	...	....	....	....	....	....

All Bath Tub Sheets	16 oz.	14 oz.	12 oz.	10 oz
Per pound	$0.25	0.27	0 29	0.32

Bolt Copper, ¼ inch diameter and over, per pound ..... 32¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

Per pound.

14 ounce to square foot and heavier ..... 26¢
12 ounce and up to 14 ounce to square foot ..... 27¢
10 ounce and up to 12 ounce ..... 29¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each ..... 8¢
Tinning sheets on one side, 30 x 60 each ..... 30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each ..... 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ..... 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each ..... 12¢
Tinning sheets on one side, other sizes, per square foot ..... 2½¢
For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ lb
12 oz. and lighter.....33¢. By the case...32¢ ₩ lb
24 x 48 and 30 x 60.
14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1¼
8-14	6-12	37	33	30	29	28	27	24
15	13	38	33	31	30	29	28	25
16	14	39	34	32	31	30	29	25
17	15	40	35	33	30	31	30	26
18	16	42	36	34	32	31	30	27
19	17	43	37	35	34	33	32	29
20	18-19	44	39	37	36	35	34	31
21	20	46	41	39	38	37	36	34
22	21	48	42	40	39	38	37	36
23	22	50	44	42	41	40	39	39
24	23	53	46	44	43	41	40	41
25	24	56	49	46	45	44	43	45

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ lb
bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	25 @ ... %

Roll and Sheet Brass.

Discount from list ..... 25 %

High Brass Rods.

Over 1 inch diameter	27¢
¼ inch to 1 inch diameter, both inclusive	24¢
No. 8 and less than ¼ inch diameter	26¢
Smaller than No. 8	30¢
Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.	

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	6¼¢
"Bertha"	6¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks	6¼¢
Per lb	7¼¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American	4¼¢
Newark	4¼¢
Bar	4¼¢
Pipe, subject to trade discount	6 ¢
Tin-Lined Pipe, subject to trade discount	15¢
Block Tin Pipes, subject to trade discount	45¢
Sheet, subject to trade discount	6¾¢

Solder.

½ @ ½ (Guaranteed)	15 ¢
No. 1	12 ¢
Extra Wiping	11½¢ @ 12 ¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ lb 28¢
Hallett's	" 21¢

ALUMINUM.

Prices in Ingots.

$2.00 ₩ lb in lots of 1000 lb and over.
$2.25 ₩ lb in lots of 500 lb and over.
$2.50 ₩ lb in lots of 100 lb and over.

Prices Per Pound on Rolled Sheets.

(Brown & Sharpe, Standard Gauge.)

Wider than... And including...	2 in. 10 in.	10 in. 14 in.	14 in. 18 in.	18 in. 22 in.	22 in. 24 in.
Up to No. 20 inclusive	$2.50	$2.60	$2.80	$3.00	$3.20
Nos. 21, 22, 23 and 24	2.60	2.70	2.90	3 10	3.30
Nos. 25 and 26	2.70	2.80	3.00	3.20	3.40
Nos. 27 and 28	2.80	2.90	3.10	3.30	3.50

Sheets, thinner than No. 28 gauge and wider than 24 inches, special prices not less than $5 per pound.
Add 30 cents per pound for sheets cut to particular widths and lengths.
Sheets rolled to .001 in. and under, 50 cents per ounce.
Leaf in books, 20 cents per book; $2 per pack of 10 books, sheets 5 x 5 inches.

Aluminum Tubing.

From $4 per pound upward, according to size and thickness of walls.

Aluminum Castings.

From 50 cents upwards per pound extra over the cost of the metal in ingots, according to the number wanted, weight, the difficulty of casting, cost of patterns, &c.

Aluminum Wire in Coils.

(Brown & Sharpe, Standard Gauge.)

	Per lb
All numbers up to No. 14 (.064 in.) inclusive	$3.00
Nos. 15 (.05706 in.) to 22 (.02534 in.) inclusive	3.25
Nos. 23 (.02571 in.) and 24 (.0201 in.) inclusive	3.50
Nos. 25 (.0179 in.) and 26 (.01594 in.) inclusive	3.75
Nos. 27 (.014195 in.) and 28 (.012641 in.) inclusive	4.00
Nos. 29 (.011257 in.) and 30 (.010023 in.) inclusive	4.25
No. 31 (.008928 in.)	4.50
No. 32 (.00795 in.)	4.75
No. 33 (.00708 in.)	5.00
No. 34 (.00630 in.)	5.25
No. 35 (.00561 in.)	5.75
No. 36 (.00500 in.)	6.25
No. 37 (.00445 in.)	7.00
No. 38 (.003965 in.)	8.50
No. 39 (.003531 in.)	12.00
No. 40 (.003144 in.)	16.00

Spooling, on 1-pound spools, 15 cents per pound extra
Spooling, on 10-pound spools, 5 cents per pound extra